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THE IRON TRADE REVIEW

Volume LIV Cleveland, May 14, 1914 *No. 20*

Trend in the Right Direction

But No Decided Change Has Been Recorded—Increased Activity in Pig Iron—Considerable Tonnage Pending

Bright spots continue to appear and although they sometimes fade out rather quickly, they furnish some reason for the iron trade looking forward to better conditions. That present conditions are not as bad as they are commonly supposed to be is shown by reliable statistics. For example, the reports collected by the Bridge Builders' and Structural Society and submitted to members at the meeting held in Pittsburgh last week, indicate that during the month of April, 88 per cent of the entire capacity of the bridge and structural shops of the country was contracted for. The American Bridge Co., during April, booked orders amounting to 90 per cent of its capacity. Statistics of stocks in furnace yards are also favorable. During the second half of April, there was a decrease in both northern and southern stocks. Generally speaking, changes in the iron and steel markets are slight, but are nearly all in the right direction. Reports from England are that improvement has set in, Germany is not so deeply depressed as it was and Russia is enjoying prosperity in the iron business.

Pig Iron

The placing of an order for 15,000 tons of basic by the United Steel Co., Canton, following the ordering of the same tonnage by a St. Louis company and increasing inquiries for basic in the Pittsburgh and eastern districts, are giving a somewhat more cheerful appearance to the pig iron market. In addition to the tonnages which are known to be pending, there is a good deal of quiet negotiating in the eastern district and the placing of some large tonnages at an early date is probable. These negotiations include a round tonnage of basic. Delaware River cast iron pipe manufacturers are sounding the market.

Iron Ore

The Lake Superior iron ore market drags in much the same fashion that it did when prices for 1912 delivery were announced in March of that year. Financial considerations are perhaps the most important factor in the situation, as ore buyers do not wish to incur further liabilities when they are well supplied with ore. Unless business improves, ore shipments will be sharply curtailed, but sellers are hoping for something like a repetition of the active buying of 1912, which came during the summer of that year.

Finished Material

Railroad buying continues to be disappointing, but the statement by a New York banking firm, that the Missouri Pacific would require from $60,000,000 to $70,000,000 to put it in good condition, furnishes a hint of the buying that may be expected in due time. Rail orders for the past week amount to only about 10,000 tons. In the wire industry, specifications are improving and manufacturers are hopeful that present prices can be maintained. The cutting in sheet prices continues freely and the mills in the Youngstown district disregard the Pittsburgh base. In eastern territory, some low prices are being made on plates and shapes, but the steel bar market shows less irregularity than that of the heavier products.

Coke

New River furnace coke is somewhat lower and reports of concessions on Connellsville furnace grades are heard. An eastern furnace company purchased 4,000 tons of prompt Connellsville coke at a shade below $2, ovens. Books for Latrobe foundry coke have been opened by one firm at $2.95, ovens, for six months or the year.

THE OPEN HEARTH

La Follette on the Rampage

HAVE the people any right to be heard when a measure affecting their interests very seriously is pending before the Interstate Commerce Commission? If one is to believe Senator LaFollette, everybody except himself ought to keep quiet when the Commission is considering a case.

Of course, it is true, as the Wisconsin senator has pointed out in his recent speech, that many appeals, editorials, letters and cartoons relating to the effort of the railroads to obtain higher freight rates have not been actuated by high motives. It was, of course, outrageous to demand that a member of the Commission should decide the rate increase case promptly or resign, because, as the sender of the telegram said, "Your delay is killing business." All of the appeals of shippers which ask the Commission to do anything but weigh the merits of the case were unworthy of men of intelligence, if indeed such men sent them. In spite, however, of all the false reasoning and all the innuendoes and threats made by some of those asking that the higher freight rates be granted, we believe that it was entirely proper for shippers and others interested to meet to discuss the facts and give their opinions to the Interstate Commerce Commission. So far as we have observed, there has been nothing to criticize in the campaign of publicity which the railroads have carried on.

We do not believe that the rate case occupies the position of a case pending before a court, where it would be manifestly improper for any one to offer a suggestion or opinion as to what decision should be rendered. When, however, all the facts have been submitted to the Commission and all the arguments made, we believe that it would be reprehensible for anyone to attempt to influence the Commission in reaching a decision.

But why did the honorable senator from Wisconsin, in his recent speech, vigorously attack the railroads and make charges against them? Of course, the senator would not think of influencing the Commission against the railroads, while the rate case is pending. Certainly not, for he is an honorable man. Perhaps he was merely talking, so as not to fall behind the mighty volume of words which he is expected to furnish the *Congressional Record* at each session.

Is it Returning Sanity?

WE HAVE said some pretty severe things about the House of Representatives recently and we are not taking any of them back, but we are glad to give the House credit for killing the armor plate project, at least temporarily. It is true that the provision in the naval bill authorizing the secretary of the navy to cause an inquiry to be made concerning a suitable site for and cost of, an armor plate plant, was stricken from the bill on a point of order, rather than on the merits of the proposition, but it is also true that Chairman Padgett, of the house committee on naval affairs, was not at all anxious to have the proposal adopted and that there was vigorous opposition to the plant by several of the majority party, including Mr. Dies, of Texas, whose costic comments must have caused some, at least, of his colleagues to do a little sober thinking. Mr. Dies' appeal to members not to follow socialistic tendencies of the times, and the applause which greeted him on both sides of the chamber give reason for believing that saner legislation may be looked for in Washington.

The final decision of the court of last resort in the contempt proceedings against Gompers, Mitchell and Morrison for alleged violations of injunctions issued in 1907 and 1908 against boycotting the Buck's Stove & Range Co., shows that labor as well as capital can prevent a suit from being tried on its real merits. In this respect, the case is like that of Harry Thaw, concerning whose alleged crime there is very little prospect of a final decision based upon justice and right. Money back of labor and capital too often, without resorting to corrupt methods, defeats the ends of justice by technical defenses. Will the American people tolerate forever laws which make such defenses possible? We believe not.

THE OPEN HEARTH

More Weak Spots of the Clayton Bill

THE most cheering news that has come from Washington in a long time is the announcement that Congress will probably adjourn about July 10, and that the Senate is not at all likely to pass any of the so-called anti-trust legislation that is pending. The House will, of course, make a bluff at carrying out party promises and will probably pass the Clayton anti-trust bill. It is announced that only 16 hours of general debate will probably be allowed on this very important measure. Fully that much time could profitably be devoted to considering numerous provisions of the measure which would cause litigation if they should be enacted into law.

In our issue last week, we referred to the loose wording of section 6 of the bill relating to fraternal, labor and agricultural organizations. Another section which would cause much controversy in the courts is the one which, after providing a fine of not exceeding $5,000, or imprisonment not exceeding one year, or both, as a punishment for discrimination in price "between different purchasers of commodities in the same or different sections or communities", has the proviso that nothing contained in the section shall prevent discrimination in price between purchasers of commodities on account of the difference in the grade, quality or quantity of the commodity sold, and it is further provided that nothing in the act shall prevent sellers from selecting their own customers. What does it mean to select one's own customers? It is easy to imagine how widely opinions could differ on this subject. For example, if a buyer's credit is not good, would the seller be allowed to discriminate against him?

A provision in regard to holding companies, which was placed in the bill at the last minute before it was reported to the House, allows a competing concern to acquire stock in another competing concern, providing the object of the deal is not to "substantially lessen" competition. This little amendment certainly confers upon the courts a great deal of discretion and gives the lawyers plenty of chances to argue.

With all its imperfections, however, the Clayton bill will be jammed through the House. We repeat, as we said last week, that the hope of the country lies in the Senate and we urge business men to take up the study of the Newlands bill to create an interstate trade commission, proposed as a substitute to another bill on the same subject. We believe that it will be possible, with the help of the thinking men of the country, for the senators to make an acceptable measure with the Newlands bill as a basis.

What Should Be Quoted?

AN OFFICIAL of the Geological Survey of Washington writes to THE IRON TRADE REVIEW, inquiring whether it would be a good plan to publish market quotations on fluorspar. This query suggests a kind of problem that is always before the editor of any iron trade paper. THE IRON TRADE REVIEW is anxious to serve its subscribers in every possible way and will be glad at any time to enlarge the space given to market reports and quotations, providing the additional information published is of interest to any considerable number of its subscribers. The use of fluorspar is confined almost entirely to open-hearth practice. Its cost per ton of steel is very small and steel companies contract for it for periods of a year or more. Fluorspar comes in three grades, gravel, lump and ground. Quotations today are as follows, per ton of 2,000 pounds: Gravel, from $5 to $5.50; lump, from $6 to $7 per ton, and ground, from $12 to $14.50 per ton. The large users of fluorspar are in the market only at long intervals, but they are well informed as to its value and would probably not be interested in following trade paper quotations. If, however, any subscribers find this information of value and would like to have quotations published from time to time, we shall be glad to hear from them, and publish the quotations regularly, provided a fair number are interested.

It is only by keeping constantly in touch with subscribers that we can find out what they want and we are here to serve them. Suggestions are always welcomed.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for April, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for April, 1914.	Average for Feb., 1914.	Average for May, 1913.
Bessemer pig iron, Pittsburgh..	$14.90	$14.90	$15.09	$17.90
Basic pig iron, Pittsburgh.....	13.90	13.90	14.09	15.46
No. 2 Fdy. pig iron, Pittsburgh	14.15	14.15	14.09	15.04
Northern No. 2 Fdy., Chgo....	14.25	14.25	14.25	16.50
Ferro manganese, Baltimore....	38.00	38.50	36.50	61.75
Lake Superior Charcoal, Chgo.	16.00	16.00	18.50	18.00
Malleable Bessemer, Chicago...	14.25	14.25	14.25	16.50
Southern No. 2, Birmingham..	10.50	10.50	10.50	11.70
Southern Ohio No. 2, Ironton.	13.50	13.50	13.00	15.00
Basic, eastern Pa.....	14.00	14.25	14.25	16.50
No. 2X Virginia furnace.....	12.75	12.75	12.75	14.50
No. 2X Foundry, Philadelphia.	15.00	15.00	15.00	17.00
Bessemer billets, Pbgh. & Ygn.	20.00	20.80	21.00	26.50
Op. h'th billets, Pbgh. & Yn..	20.00	20.80	20.75	26.50
Bess. sheet bars, Pbgh. & Yn.	21.00	21.60	22.00	27.50
Op. h'th sh. bars, Pbgh. & Yn.	21.00	21.60	21.75	27.50
Steel bars, Pittsburgh.....	1.15	1.20	1.20	1.40
Iron bars, Philadelphia.....	1.22	1.22	1.27	1.57
Steel bars, Chicago.....	1.30	1.43	1.43	1.58
Tank plates, Chicago.....	1.30	1.33	1.38	1.63

	Today's prices.	Average for April, 1914.	Average for Feb., 1914.	Average for May, 1913.
Structural shapes, Chicago....	$1.30	$1.35	$1.38	$1.63
Iron bars, Cleveland.....	1.20	1.25	1.30	1.63
Iron bars, Chgo. mill.....	1.10	1.15	1.20	1.57½
Beams, Pittsburgh	1.15	1.18	1.20	1.45
Beams, Philadelphia	1.25	1.30	1.30	1.60
Tank plates, Pittsburgh.....	1.15	1.15	1.20	1.45
Tank plates, Philadelphia.....	1.30	1.30	1.30	1.75
Sheets, blk., No. 28, Pittsburgh	1.85	1.92	1.94	2.28
Sheets, blue ann., No. 10, Pbgh.	1.35	1.40	1.40	1.75
Sheets, galv., No. 28, Pbgh....	2.80	2.92	2.94	3.39
Wire nails, Pittsburgh.....	1.60	1.60	1.59	1.78
Connellsville fur. coke, contr..	2.00	2.00	1.92	2.25
Connellsville fdy. coke contr...	2.50	2.50	2.50	3.00
Heavy melting steel, Pbgh....	12.00	12.00	12.37	13.06
Heavy melting steel, east'n Pa.	11.00	11.00	10.50	12.50
Heavy melting steel, Chgo.....	10.00	10.25	9.70	12.50
Heavy cast, eastern Pa.....	13.00	13.00	12.50	13.50
No. 1 wrought, eastern Pa....	13.00	14.50	13.50	15.50
No. 1 wrought, Chgo.....	8.75	9.00	9.50	9.20
Rerolling rails, Chgo.....	11.75	11.75	11.63	14.00
Car wheels, Chgo.....	11.50	11.50	12.25	17.00

(For Additional Prices See Page 894.)

More Activity in Basic Pig Iron

American Steel Foundries Negotiating—Canton Company Closes for 12,000 Tons—Additional St. Louis Purchase

The basic pig iron market in the valleys and Pittsburgh district shows signs of activity. The American Steel Foundries, which has been negotiating for several weeks, is now actively figuring on 10,000 tons of standard basic for shipment to plants at Sharon, Pa., and Alliance, O. The United Steel Co., Canton, O., has closed for 15,000 tons of third quarter basic through northern Ohio furnace interests. An Ohio river melter has taken about 2,000 tons of prompt basic from a nearby stack, and quiet negotiations have been opened by several basic consumers. Basic is listed at $13, valley. Bessemer is quiet, but apparently unchanged at $14, valley. No. 2 foundry, malleable and gray forge are unchanged in position. Despite reduction in lake ore prices, furnacemen do not believe pig iron prices will further decline. It will be recalled that all grades of pig iron reflected strength immediately after the 1912 ore price came out; today's ore prices are the same as those prevailing two years ago.

Will Probably Come from Cleveland

The purchase of 15,000 tons of third quarter basic by the United Steel Co., Canton, O., was, it is generally believed, made from a Cleveland firm, but no official announcement to that effect has been made, nor has the price been disclosed. Several Cleveland interests did not submit prices and others submitted prices which proved to be too high. Deliveries in the Cleveland district are only fair and there is no demand for foundry grades.

Cincinnati Dull

It would be almost impossible for the Cincinnati market to be more quiet than it is at the present time. Dealers are figuring on only carload lots and not a single inquiry of importance is pending. The month of April was one of the dullest in the history of the pig iron market, but May has been equally dull up to the present time. Shipments on old orders are not going forward as rapidly as they were two or three weeks ago. Melters are maintaining their policy of buying only from hand to mouth as requirements demand, which explains numerous requests for sudden shipments of small lots that have been reported recently.

Southern Ohio furnaces have taken a decided stand against accepting any business below $13.50, Ironton basis, for No. 2 foundry, and this is the minimum quotation at the present time. Very little, if any, business is being placed at this figure, especially when in competition with other furnaces with equal freight rates.

Southern No. 2 foundry iron is quoted at from $10.50 to $11, Birmingham basis, for either prompt shipment or delivery through the second half, including makes from both Tennessee and Alabama.

Chicago Pig Iron Lifeless

At Chicago market pig iron is as dull as can be imagined. Apparent quickening of inquiry for basic the first of the month did not continue more than two or three days and nothing resulted from the inquiries except the 15,000 tons sold the Commonwealth Steel Co. Small orders for carloads, or slightly more, continue to be received, but the volume is not sufficient to give the market steadiness.

Quotations remain nominal at $14.25, Chicago furnace, for No. 2 foundry and malleable Bessemer. Southern iron is in light demand at $10.50, Birmingham, and some slight inquiry is being received for second half requirements, on which a few sales have been made at $11, Birmingham. Iron for immediate delivery may be obtained at $10.50, but some tonnage is being disposed of at $10.75, Birmingham.

More Basic Bought

The Commonwealth Steel Co., St. Louis, has purchased 5,000 tons of northern basic iron in addition to the

(*For complete prices see page* 894)

10,000 tons reported last week. The Illinois Steel Co. sold the iron for delivery over May to September at $14.50, delivered. The Alton Steel Co. also is reported to have bought 5,000 tons of basic, and there is an inquiry out for 2,000 tons of malleable.

At St. Louis, southern No. 2 is nominally quoted at $10.50, $10.75 and $11, Birmingham basis, with only one or two special brands held at the higher figure. Shipments on contracts are in good demand. Northern No. 2 iron is quoted at $13.50, Ironton, and $14.25, Chicago furnaces.

Inquiry at Buffalo

Furnaces in the Buffalo district have felt a change in the attitude of the consumers, although it is but slight. Inquiry in the past week for iron of all grades has increased to a point where it is evident that users are considering their future needs. The iron under negotiation to be booked amounts to about 7,000 tons. Prices remain unchanged and the sales of the week, made up wholly of small lots, amounted to not more than 2,000 tons.

The Rogers-Brown Iron Co., Susquehanna plant, put out of blast its stack No. 3 on Friday, May 8.

Tonnages Figured in Philadelphia

Negotiations now being carried on quietly and in tentative form by large buyers in the Philadelphia and eastern Pennsylvania market hold out the promise that some heavy purchases of iron may be made there within a few days. A Harrisburg steel maker which recently sounded out the market on basic has actively revived those negotiations and is figuring with makers for its requirements of this grade for third and fourth quarters, amounting to about 25,000 tons. If a satisfactory figure is obtained, it is expected the whole tonnage will be closed. Eastern basic for prompt shipment, as reported, has recently sold for $14, delivered, but for forward delivery, makers are quoting $14.25, delivered. The buyer's ideas of price in this negotiation are below the latter figure. Other basic tonnage for shipment out of the eastern Pennsylvania district is pending in a tentative way. Some of the cast iron pipe makers along the Delaware river also continue to feel out the market. A new inquiry for 500 to 1,000 tons and another for 3,000 tons, which has been out several weeks, are pending for such buyers. The possibility of the purchase of a round block of mill forge is another matter before the trade. Apart from these sub-rosa negotiations, the market remains very quiet and sales are practically nominal. One Philadelphia buyer took 500 tons of prompt malleable and off-basic. Eastern Pennsylvania furnacemen view the situation without assurance and though merchant operations now are only about 30 to 40 per cent of capacity, some further blowing out, including one Warwick and the Temple stacks, is in contemplation. The statistics of the Eastern Pig Iron Association in April show a small loss in stocks due to light operations, but orders fell off considerably. Foundry iron prices continue from $14.75 to $15, Philadelphia, for No. 2X. In Virginia, the leading maker has extended through the last half its previous schedule of $13, furnace, for No. 2X for third quarter. Standard low phosphorus remains $21, Philadelphia, on small sales, but lower could be done on a tonnage.

More Wabana Iron Coming

Another cargo of Wabana, Nova Scotia, iron, amounting to about 3,500 tons, has sailed from Sydney to Philadelphia by the steamer Heathcote. The iron will be applied on former sales made largely to cast iron pipe makers in the eastern Pennsylvania district. This will make the third cargo of this iron to come in recently, the others having docked at Philadelphia and at Bridgeport, Conn., and the total delivered reaches about 8,000 tons. Only small sales of this iron have been made recently.

More Inquiry at New York

More interest in a scattered way is being given to pig iron purchasers by buyers in Connecticut, New Jersey and at other nearby New York City points. The larger consumers appear to be watching the situation more closely. This is leading to the belief that more liberal buying is not far distant and is giving conditions a little better undertone. Miscellaneous inquiry has increased to about 6,000 tons, including 3,000 tons of No. 1X and No. 2 plain for a Newark, N. J., buyer, which was reported a week ago and will be closed this week; 1,500 tons of foundry malleable and charcoal for a railway equipment maker for Illinois and Michigan plants; 500 tons of high silicon iron for a Connecticut plant; 300 to 400 tons of charcoal for a New England buyer and other scattered lots. The purchase of one round block of basic is a possibility of the near future, as it is being considered. Sales continue light, but they are considerably ahead of April. A Connecticut buyer who was figuring on 3,000 tons of mixed grades for last half, has closed for 2,000 tons with a Buffalo maker. While prices incline softer, there is no sharp weakness. The tidewater market remains at $14.75 to $15 for No. 2X. Reports of $15.45, New England, for No. 2X, continue to be heard. Export inquiries have been more numerous, the largest, 10,000 tons for Italy, now being reported to have been closed with German makers. About 10,000 tons of other inquiry, principally for Russia and Italy, are current.

(*For complete prices see page* 894)

English Makers Reduce Ferro

English makers of ferro-manganese May 12 announced a reduction of $1 a ton to $38, seaboard. This is the first change that has been announced since the market gradually re-established itself early in February, following a period of active selling at lower prices. German ferro-manganese remains unchanged at $38, seaboard. Selling is light and only carloads and small lots are of interest to consumers.

Ferro-Alloys Quiet at Pittsburgh

Ferro-alloy dealers in the Pittsburgh district find conditions unchanged this week. A couple of small lots of ferro-manganese have been sold at $38, seaboard, to consumers who scoured the market for re-sale material, in hope of shading the minimum market price. Ferro-silicon is quiet; quotations for all grades of this alloy are nominal.

Semi Finished Material Quiet

The market for semi-finished steel products is quiet in the Pittsburgh district, and some re-sale material is being offered. Billets and sheet bars are not commanding above $20 and $21, mill, respectively, and forging billets have sold at less than $25, Pittsburgh. Muck bar is nominally listed at $28, Pittsburgh. Wire rods are named at $26.

Lifeless at Ashland

The market is lifeless at Ashland. Billets are quoted $20.50, Ashland, which is a decline of 50 cents since last week. Wire rods are unchanged at $26.50, Ashland.

Eastern Buying is Scant

There is practically no new business of importance now being placed before eastern Pennsylvania billet makers and selling drags. Buyers with old contracts are, however, taking steel freely. Prices remain at $22.40 to $23.40, Philadelphia, for rolling and $4 to $5 higher for forging steel, depending upon individual conditions.

Sheets Low at Chicago

And Mills in Other Sections Are Making Concessions

Steel sheets in the Chicago market are almost the weakest point. Quotations in the last week have weakened and 2.08c and 3.08c, Chicago, for No. 28 gage black and galvanized, have disappeared, nothing higher than 2.03c and 3.03c now being apparent. Makers are anxious to take some prompt tonnage and the latter mentioned quotations have been shaded in several instances.

Mills are approaching the beginning of the third quarter and have nothing on their books for that period, but at the same time are not anxious to contract beyond the middle of the year at the prices now prevailing. The deadlock between buyers and sellers is complete and an insight into prices will not be possible until a more active inquiry comes before the market.

Prices Holding at Cincinnati

The market in the Cincinnati territory is very quiet. Although lower prices are reported made in adjoining districts, nearby mills have made no concessions during the past week, and some state that they prefer to lose business rather than sell at lower figures. Black sheets are quoted at 1.95c, Cincinnati, for No. 28 gage, and galvanized No. 28 gage are given at from 2.90c to 2.95c, Cincinnati. Blue annealed No. 10 are being held at from 1.45c to 1.50c.

In the Cleveland district the usual quotations on sheets are 1.85c, Pittsburgh, for No. 28 black, 2.85c, Pittsburgh, for No. 28 galvanized, and 1.40c, Pittsburgh, for No. 10 blue annealed, but valley mills do not hesitate to quote these same prices at their mills when necessary to take business, making the delivered prices lower to buyers who are advantageously located.

In the Buffalo district, there seems to be a good demand for sheets, but at prices which reflect a softening of the present quoted schedules. Full operation is the report of the local sheet mill.

Sheet Prices Lower at Pittsburgh

The market for steel sheets in the Pittsburgh district continues to show uncertainty and irregularity. Galvanized sheets are selling at 2.80c for base size gage, and black sheets have been obtained as low as 1.80c, for No. 28 gage, in isolated cases, but leading mills are asking 1.90c. Blue annealed sheets are commanding 1.35c to 1.40c. Sheet mill operations have dwindled and some of the larger mills are not producing more than from 55 to 60 per cent of capacity. Specifications are light and new buying is below normal.

Most of the sheet business in the eastern Pennsylvania market which is of an odd-lot character is going at 1.55c, Philadelphia, or 1.40c, Pittsburgh, for No. 10 gage blue annealed. Orders desirable in size and in other considerations, however, can be placed $1 lower. Mill operations with leading eastern makers are unchanged.

Plates for New Vessels

Includes 6,000 Tons for Navy and Steamship for Pacific Coast

Vessel construction offers some fair tonnages of plates in eastern Pennsylvania and in other eastern districts. The navy department took bids, May 11, on about 6,000 tons for a supply ship and a transport to be built at the Philadelphia and Boston navy yards. The Harlan & Hollingsworth Corporation has booked a steamship for Pacific coast traffic requiring about 1,500 tons, mostly plates. Eastern Pennsylvania plate makers observe no change in the indifferent character of the market. Orders are miscellaneous and for quick delivery. On such business the usual price is 1.30c, Philadelphia, or 1.15c, Pittsburgh. On attractive orders, however, it is understood some makers, east and west, will shade this figure about $1 a ton, for eastern delivery.

Plates for Pipe Line

The Beaver Engineering & Construction Co. has been awarded the contract for a pipe line in Brooklyn, forming part of the Catskill aqueduct, which will require 2,000 to 3,000 tons of plates. Small orders still make up the New York plate market and upon these the usual price is 1.31c, delivered, or 1.15c, Pittsburgh. Some of the more aggressive sellers, however, have been cutting this figure $1 a ton, but it usually requires the more attractive class of business to bring out this price.

Plates Quiet at Pittsburgh

Manufacturers of plates, shapes and bars in the Pittsburgh district express the fear that the long-expected turn in the market will not come until fall, although some prognosticators are more optimistic in their predictions. Steel plates are being held at 1.15c by leading makers, and that figure represents the market fairly accurately; tonnage has sold at 1.12½c, and even as low as 1.10c in isolated cases.

Makers of sheared plates are holding at 1.45c, Cincinnati, under unfavorable conditions. The market in that city is very quiet and demand is mostly in small lots.

There is practically no activity in plates in the Buffalo district. Small lots have been placed but nothing involving much tonnage since the latter part of February. The price of 1.15c, base, is being maintained, however.

Cast Iron Pipe

Is Not Active—Eastern Inquiries for Small Tonnages

Small inquiries are coming out freely in the eastern cast iron pipe market, but the larger tonnages from either municipal or private buyers are fewer. Prices lack firmness. A leading eastern Pennsylvania shop, having accumulated a considerable stock in these sizes, is offering 4-inch pipe at $20.50 and 6 and 8-inch pipe at $19, at the shop. The Davies & Thomas Foundry Co., Catasauqua, Pa., has taken 800 tons of cast iron segments for the Harlem River subway tunnel, New York City. R. D. Wood & Co. are low bidder at $20.50, delivered, on all sizes for 690 tons of 4, 6, 8 and 10's for Pompton Lakes, N. J. The board of water supply, New York City, took bids May 12 on 1,700 tons of 48-inch pipe.

Chicago Pipe Market Dull

No improvement in demand for cast iron pipe is apparent at Chicago. Except for contractors' orders and routine business for a few carloads at a time, business is practically nothing.

The long pipe line project by Highland Park, Mich., is still under consideration, but it has not yet been determined whether it will be cast iron pipe or some other form. About 250 tons of water pipe is to be closed at Moline, Ill., this week and Valley Junction, Ia., has taken bids on about 400 tons to close shortly.

(*For complete prices see page* 894)

Ore Buying Very Slow

Financial Considerations Have Important Bearing on the Situation

"I may not get cake with chocolate frosting; probably I shall have to use corn bread, and I may even get down to hard tack, but I am going to take my chance in buying ore this year and not do it in a hurry."

That, according to an ore seller is about the attitude of the average furnace operator at the present time. The furnaces are so well supplied with ore and are so uncertain as to how much will be required, that they are unwilling to take any step which commits them to final obligations. The payment for ore begins on the 20th day of the month following the month in which the purchase is made. The ore market drags at present and the question is, What will the ore companies do about it? It seems inevitable that if present conditions continue, mining operations will be sharply curtailed and the movement of ore up to July 1, at least, will be very light. The space on docks for the storage of ore is extremely limited, and no alternative but curtailment of production seems possible. Ore sellers are, however, not disposed to be without hope for a change for the better and they point to the season of 1912, when prices were fixed on March 20, of that year. The market lagged for a month or so, but picked up later and ore was rapidly sold during the spring and early summer.

Figure Lake Ore in the East

Some negotiations for lake ore now are being carried on by eastern Pennsylvania furnace interests and some contracts of this kind are expected to be closed shortly. Another cargo of Wabana, Newfoundland, ore, the second of the season, is en route to Philadelphia and will be followed shortly by a third cargo. This ore, as reported, is being shipped against portions of contracts carried over from last season and no new sales have been made. Some new selling of Port Henry ores has been done and a good movement continues, but this is largely against old contracts.

Warehouse Business Slow

Warehouse quotations on steel products in Chicago are unchanged in spite of lower quotations on mill products. Business is better during May than was the case in April and warehouse men believe that if the brick makers' strike did not hold back deliveries in Chicago proper the volume of business would be almost equal to that experienced during the same month last year.

Better Tone at Cincinnati

The tone in the Cincinnati market is a little better, but business shows no improvement. Demand is mostly for structurals and light building materials. Several dealers also state that they have closed for a fair tonnage of concrete reinforcing bars since the first of the month. Prices are unchanged and smaller dealers are underbidding the market with less frequency than they were about two weeks ago.

In the Cleveland district warehouse business is running along but very little better this month than it was last, considering the fact that some of the warehouses have been very energetic in seeking business, the volume of new orders placed is not encouraging.

Better Demand at New York

Warehouse demand at New York City so far in May is considerably better than in April. The light stocks being carried by most buyers appears to be forcing them to call upon jobbers more freely for piecing-in needs, now that the construction season is active. Prices are unchanged.

For Reinforcing Bars

There is Fair Demand—Quotations Lower at Chicago

New business in steel bars at Philadelphia and vicinity shows no appreciable change and is small. The principal offers remain in reinforcing bars for which Philadelphia contractors and Baltimore jobbers have out more than 5,000 tons for various jobs. A new inquiry of 500 tons for a Ford assembling plant at Cincinnati is offered. Specifications are a little better. Some reports which lack full corroboration indicate that 1.15c, Pittsburgh, has been shaded in recent instances at Baltimore, but the Philadelphia market remains constant at 1.30c, or 1.15c, Pittsburgh.

No Change at New York

The steel bar market at New York City and vicinity shows little change. New buying is small and specifications are only fair. There is some buying of concrete bars in small lots. The market appears evenly held at 1.31c, New York, or 1.15c, Pittsburgh.

Chicago Steel Bars Lower

While quotations on steel bars continue to be 1.30c to 1.35c, Chicago, the most attractive business can shade these prices. Business sufficiently attractive to the mills has been done at 1.28c, Chicago, but the tonnage at this price has been small and probably not sufficient to establish a quotation at that level. Mills are hungry for tonnage and until books are in much better shape it is not expected prices will go above 1.33c, Chicago.

The market for iron bars in Chicago continues to touch bottom. Quotations are still well represented at 1.10c to 1.12½c, Chicago, and makers are listless when new business is offered at these prices. One interest, whose mills have been running full capacity for a long time, finds the backlog eaten into severely and unless a buying movement arrives soon will go on a single turn.

Building operations under way and in architects' hands in the Buffalo territory have brought out considerable call for reinforcing bars for concrete construction. The mills and agencies of the district are quoting 1.15c, base.

Eastern Market Still Dull

In eastern Pennsylvania the bar iron market remains quiet and prices, while not strong, are more stable. The present range of the market for common bars is from 1.20c to 1.27c, Philadelphia.

The market for hoops and bands is marking time in the Pittsburgh district, reflecting neither strength nor weakness. Cold-rolled shafting, listed at 65 per cent off list is weak and irregular. No talk of cotton tie prices is heard.

Nuts, Bolts and Rivets

Pittsburgh manufacturers of nuts, bolts and rivets are selling material at rather wide ranges in price, and it is difficult to represent the market accurately for this reason. Specifications continue light and there is no new buying of consequence.

(*For complete prices see page* 894)

Scrap Buyers Dictate

In Eastern Pennsylvania—Old Material Markets Dull and Prices Weak

The absence of any tonnage buying keeps the eastern Pennsylvania scrap market narrow and inclined toward price easiness. Small lots moving, some of them under pressure, bring largely the buyer's own terms. At the same time, one consumer who needed a small lot of heavy steel paid $11, delivered, the full price, this week. Heavy cast has declined under larger offerings by dealers obtained through the recent scrapping of several iron manufacturing plants in eastern Pennsylvania. Railroad wrought also is lower. One eastern consumer continues to take some lots of wrought pipe at $10.25, delivered. Railroad awards for April brought lower prices. The steel went not over $11, delivered, and the car wheels at about $12, delivered.

Scrap Drags at Metropolis

Dealers find it difficult to make sales in the New York City market, as buyers continue to display small interest. Under these conditions, some material is going begging and prices have weakened in some grades. About 6,000 tons of cast scrap recently was awarded John Leonard & Co. from the dismantling of several power houses in Manhattan.

Buffalo Market Unsettled

Mills in the Buffalo district are not in the market for scrap, the dealers show little inclination to sell beyond small tonnages at prevailing prices, and the scrap situation in this territory remains practically flat and unsettled. Prices have undergone no change in the past week.

Pittsburgh Scrap Marks Time

The market for old material at Pittsburgh continues to mark time, but prices are holding their own fairly well. Some of the heaviest melters in the district have not figured in the market for 30 or 40 days.

Holding Material

At Cleveland little business is being transacted in the scrap market. Dealers appear rather loathe to part with material at present market prices. About the only scrap available at these levels is put on the market by producers not having storage room. The Upson Nut Co. continues to refuse shipments; rolling mills are taking on little scrap, running their plants only a portion of the time. Prices are unchanged.

No. 1 machine cast continues to be the surprise in the Cincinnati iron and steel scrap market, as it has suffered another decline during the past week, being now quoted at from $9.25 to $9.75 per net ton. This material is usually the most active in that market because of the demand from foundries making machine tool castings, but it has slumped badly since the first of the year. No. 1 busheling and No. 1 yard wrought have also slumped during the past few days, the former about 25 cents a ton and the latter about 75 cents a ton. The market is absolutely lifeless and weak.

Chicago Scrap at Standstill

The scrap market in Chicago is more nearly inactive than has been the case in many months. A slight buying movement, apparent a fortnight ago, was entirely composed of short covering, which has been accomplished, and now in the absence of any demand, prices remain at the level they were left by that wave of activity. Quotations are entirely nominal and so little business is moving that it is impossible to determine what might be done if tonnage should be needed. The leading interests in this market are not taking on additional supplies except an occasional bargain. An embargo is in effect at the plant of the Alton Steel Co., Alton, Ill., but this is the only one in this territory.

Railroad offerings are not as heavy as has been the case and the following are now before the market: Chicago, Milwaukee & St. Paul, 3,200 tons; Santa Fe, 3,500 tons; Grank Trunk, 1,000 tons; Chicago, Peoria & St. Louis, 1,200 tons.

Scrap iron prices are unchanged at St. Louis. No new lists are out today. All of those reported last week were closed.

New River Coke Lower

For Furnace Grades—Connellsville Coke Not Strong—Market Dull

A slight decline in New River furnace coke has taken place during the past week at Cincinnati, the price now being from $2.20 to $2.35, ovens. Foundry coke from these fields is unchanged at from $2.75 to $3.50, ovens. The Pocahontas market is a little weaker proportionately than the others and a large number of ovens in this district have been shut down recently. A number of operations in all of the fields are running at less than 50 per cent of their capacities, and others are blowing out ovens as contracts terminate. Wise county and Pocahontas prices are unchanged, being the same in both cases at from $1.90 to $2.10 for furnace coke and from $2.40 to $2.75 for foundry coke.

Connellsville Coke Dull

The Connellsville coke market is quiet, and not so strong as a few weeks ago. Some furnace fuel is being offered at Pittsburgh at $1.80, ovens, for spot delivery, and reports of that figure being shaded are heard. Leading shippers continue to ask $2, ovens, on contract. Foundry coke is unchanged in position. The *Connellsville Courier*, for the week ending May 2, says production was 305,610 tons, a decrease of 8,147, compared with the week before.

The Jamison Coke & Coal Co., having opened its books on foundry coke, for the year or six months beginning July 1, at $2.95 Latrobe ovens, has been booking a number of contracts throughout eastern territory. The present year's price is a reduction of 25 cents a ton from last year. Considerable buying of other brands of foundry coke in eastern and New England territories is being done for similar periods of delivery. A Lehigh Valley furnace recently purchased 4,000 tons of prompt Connellsville furnace coke at a shade below $2, ovens.

The coke market in the St. Louis territory was enlivened today by the appearance of an inquiry from the St. Joseph Lead Co., of 30,000 tons, 48-hour furnace grade. Connellsville 72-hour foundry coke is quoted at $2.50 to $2.65, and Virginia at about the same price.

Tin Plate Mills Busy

Tin plate mills in Ohio and western Pennsylvania are operating at maximum capacities, and this department continues to be the one bright spot in the general market. Specifications, in some cases, are coming out slowly, but shipments are normal. The open market price is being shaded $2 a ton when attractive orders are involved.

(*For complete prices see page* 894)

Structural Shops' Good Showing

With Large Percentage of Capacity Booked—Eastern Plants of American Bridge Co. Are Busy

Capacity of bridge and structural shops of the country contracted for during the month of April increased 12 per cent over March, according to the reports collected by the secretary of the Bridge Builders and Structural Society. In April, 88 per cent of the capacity was booked, compared with 76 per cent in March. The announcement of April bookings was made at the monthly meeting of the society at Pittsburgh, May 8.

The American Bridge Co., in its eastern division, booked in March 35,000 tons, while 65,000 to 70,000 tons of reported awards went to independent shops. During April the eastern plants of the American Bridge Co. ran at 90 per cent of capacity. The 100,000 tons of work placed in the eastern division last month indicates a total in the country of at least 150,000 tons, which is a good showing. The east continues to show fair lettings, awards of the week reaching about 25,000 tons. An interesting new inquiry offered at New York is a bridge across the Ohio river for the Chesapeake & Ohio railroad, requiring 15,000 tons. Shape prices at New York City remain at from 1.26c to 1.31c, delivered, though some eastern mills who have been selling at the lower figure appear less keen to make this price freely.

Less Aggressiveness in East

Some eastern Pennsylvania shape mills which have been quite active for tonnage recently and have done 1.10c, Pittsburgh, for eastern delivery, in specific cases, now appear less aggressive about Philadelphia, as they have accumulated fair bookings. The current market of small lots is about 1.30c, Philadelphia, or 1.15c, Pittsburgh. At the same time, it is indicated an attractive order would bring a lower figure. The volume of business continues moderate in Philadelphia and vicinity. About 2,500 tons of shapes for vessel construction, including 2,000 tons for a transport and a supply ship for the navy department and 1,500 tons for quay construction on the Panama canal, are being bid upon. An eastern Pennsylvania fabricator asks about 1,000 tons of plain material.

Structural Demand Improves

Buffalo mills and agencies report an improvement in the demand for structural material in the past 10 days, due to a number of building operations coming out, but none of them taking very large tonnages. For immediate delivery, 1.15c, base, is quoted, and 1.20c, base, for more extended deliveries, although there is no booking being considered at Buffalo beyond the end of the present quarter.

Little Tonnage at Pittsburgh

Pittsburgh fabricators have experienced another quiet week in the immediate district, and more important interests say there are no indications of improvement in sight. Structural shapes are relatively stronger than plates or bars; shapes are selling at 1.15c in large tonnages, but $1 a ton above that figure continues to be obtained in a number of instances.

At Cleveland, the principal project now pending is the warehouse of the W. Bingham Co., which will require 4,000 tons of shapes and reinforcing bars. Plans will be ready Saturday. A building project, concerning which nothing definite has been announced, will require 1,200 tons, and the outlook for bridge material is more favorable.

Chicago Tonnages are Small

Structural lettings for the week in the Chicago district total about 3,000 tons. Only one item is as large as 1,000 tons and the remainder are 300 tons each or smaller. The business is well scattered, both as to locality and as to concerns successful in bidding. The steel for the pier house in Chicago, the general contract for which went to the Warner Construction Co., has not yet been awarded.

With dullness in demand the Chicago shape market has made no gain in the past week. Business seems to be confined to small tonnages and buyers are shopping strenuously to obtain the lowest prices possible. Although the market is resisting the downward tendency, some tonnage has been done below the established quotation, 1.30c to 1.35c, Chicago, but most of the tonnage has gone at about 1.30c. Mills have rolled most of the more desirable business on the books and at present seem to be working on the least profitable business and at only a fraction of their capacity.

CONTRACTS AWARDED.

Addition to Borland building, Chicago, 1,126 tons, to Hansell-Elcock, Chicago.

Loomis breaker, near Wilkesbarre, Pa., for Delaware, Lackawanna & Western Coal Co., 1,000 tons. Awarded to the Guerber Engineering Co.

Cedar Rapids Mfg. & Power Co., Boston, galvanized river crossing towers, 250 tons, for shipment to Cedars, Quebec and Massena, N. Y., awarded to the Riter-Conley Mfg. Co.

Theater for Crosskey Amusement Co., Philadelphia, 325 tons, awarded to Belmont Iron Works.

Louisville Gas & Electric Co., structural steel for building, Louisville, Ky., 308 tons, to Grainger & Co., Louisville, Ky.

Pauline street wharf shed, New Orleans, La., 297 tons, to Modern Steel Structural Co., Waukesha, Wis.

The Riter-Conley Mfg. Co., Pittsburgh, 20 55,000-barrel oil tanks, involving 3,000 tons, for shipment to several oil interests in the Cushing field, Oklahoma.

Scandinavian Bank & Northwestern Trust Co. building, Grand Forks, Minn., 260 tons, to St. Paul Foundry Co.

Post office building, Berkeley, Cal., 200 tons, to the Pacific Rolling Mill Co., San Francisco.

A. O. Stewart, San Francisco, Cal., hotel building, San Francisco, Cal., 200 tons to Central Iron Works, San Francisco.

The Pennsylvania railroad, 450 tons of bridge work, awarded to the Riter-Conley Mfg. Co.

Mark-Brock Amusement Co., Buffalo, two picture theaters, Buffalo, taking 300 and 250 tons structural, general contracts to Cramp & Co., Philadelphia.

Firestone Rubber Co. building, Akron, 700 tons of shapes and 300 tons of bars, Berger Iron Co.

Section No. 1 of the Broadway-Fourth avenue subway line, New York City, steel work, 4,750 tons, awarded to the American Bridge Co. by the general contractors, Booth & Flynn, Ltd., Pittsburgh.

Guthrie school, Wilkesbarre, Pa., 550 tons, awarded to the Guerber Engineering Co.

Electric Bond & Share Co., New York, surge tank, 40 x 117 feet, and connection, 300 tons to be used in connection with the company's Oneida Development in Utah, awarded Riter-Conley Mfg. Co.

Highway bridge, Chattanooga, Tenn., for the Tennessee Bridge Co., 350 tons, sublet by Nashville Bridge Co., to the Phoenix Bridge Co.

Bridge work for New York Central & Hudson River Railroad, 1,900 tons, divided among Phoenix Bridge Works, L. F. Shoemaker & Co., Belmont Iron Works and other independents; about 550 tons upon which bids were entered, were abandoned.

Charleston Traction Co., bridge at Charleston, W. Va., 1,500 tons, awarded American Bridge Co.

Bridge work for Boston & Albany railroad, 1,200 tons, divided among American Bridge Co., L. F. Shoemaker & Co. and several other fabricators.

Astor apartment on Broadway, between Eighty-ninth and Nintieth streets, New York City, 2,500 tons, awarded to Levering & Gerrigues.

Building for Oxford Paper Co., Mumford Falls, Me., 400 tons, awarded to Jones & Laughlin Steel Co.

Building for Dwight Mfg. Co., Chicopee, Mass., textile manufacturers, 300 tons, awarded to Lackawanna Steel Co.

Trestle for Old Dominion Soapstone Co.,

Esmont, Va., 300 tons, awarded to independent shop.

Highway bridge, Zanesville, O., 1,350 tons, awarded McClintic-Marshall Construction Co.

Section No. 1A of the Broadway-Fourth avenue subway line, Brooklyn, 9,400 tons, steel work to be furnished the Cranford Co., general contractor, by the American Bridge Co.

First National Bank building, Bridgeport, Conn., 700 tons, awarded to Levering & Gerrigues.

CONTRACTS PENDING.

Building for Commercial Trust & Savings Co., Memphis, Tenn., 10 to 20 stories, 1,600 to 1,800 tons required for maximum height; bids taken.

Second breaker for Delaware, Lackawanna & Western Coal Co. near Wilkesbarre, Pa., 1,000 tons; plans about to be issued.

High school, Nanticoke, Pa., about 600 tons, bids being taken.

Seneca street viaduct, Buffalo, alteration floor construction, taking bids, 300 to 400 tons.

New plant, J. W. Clement Printing Co., Buffalo, revised bids in, 300 tons structural.

Santol Rubber Co., Niagara Falls, N. Y., new plant, bids in last week, 300 tons structural, quantity reinforcing bars.

Municipal building, Waterbury, Conn., 800 tons, bids being taken.

Bridge for Chesapeake & Ohio railroad across the Ohio river at Portsmouth, O., 15,000 tons, plans originally issued for bids May 12 but date extended to June 2. Gustav Lindenthal, 68 William street, New York City, consulting engineer.

Building for University of Michigan, Ann Arbor, Mich., 500 tons, bids being taken.

Wm. Bingham Co., Cleveland, warehouse, 4,000 tons of shapes and bars; plans ready May 16.

Kanawha Bridge, Charleston, W. Va., 400 tons. Bids to be taken soon.

Marion Steam Shovel Co., Marion, O., 350 tons, crane runway.

Rail Orders Light

New York, May 13. (By wire.)—Rail bookings by the United States Steel Corporation in the week reached only about 10,000 tons. The Carnegie Steel Co. took about 1,500 tons from the New York, Susquehanna & Western. The Tennessee Coal, Iron & Railroad Co. took 2,500 tons from the Tennessee Central and 2,500 from an industrial company. The remainder was in scattered orders.

Car business is very dull, the past week being practically bare of awards. It seems pretty conclusive that nothing much may be expected before the freight rate question is settled. The Illinois Central railroad has taken bids on 3,000 box cars, but it is a question whether orders will be placed on the present specifications and revised figures may be taken. The Delaware, Lackawanna & Western is inquiring for 200 automobile cars, in addition to 500 hoppers. The Havana Central is taking figures on 350 flats, 20 box, 40 caboose and 40 narrow gage cars. The Union Pacific took bids this week on a large passenger equipment inquiry. The Pressed Steel Car Co. will rebuild about 250 coal cars for the Newburgh & South Shore railroad.

In rails, the Seaboard Air Line is in the market for 17,000 tons and the Interborough Rapid Transit Co. for 2,600 tons for extensions in New York City. Orders continue small.

Track Fastenings More Active

A distinctly better feeling is expressed by some dealers in rails and track fastenings in Chicago. This month so far has presented a better tonnage than in an equal period during April and the present week opens with a continuation of this condition. One interest has received orders in one day this week for goods in every line it manufactures. Some orders were in addition to previous orders placed this year and some were releases of former contracts which had been held up previously. While the orders were not sufficiently large to cause any feeling of jubilation, the tendency is in the right direction and those in touch with the situation are somewhat encouraged.

CAR AND LOCOMOTIVE ORDERS.

The Northern Pacific railroad is taking bids on 107 passenger coaches of miscellaneous types.

The Delaware & Hudson Co. has placed 15 superheater consolidation freight locomotives and 10 superheater Pacific passenger locomotives, with the American Locomotive Co.

The Mobile & Ohio railroad has ordered seven superheater consolidation freight locomotives from the American Locomotive Co.

The Kansas City Southern railway is inquiring for 100 ballast cars.

Wire Prospects Are Improving

A short time ago, appearances indicated that there might be a reduction in the price of wire products, but bright spots have appeared during the past week, and while an advance is not expected, it is believed that present quotations can be maintained. Wire manufacturers are somewhat more cheerful, especially in the Cleveland district.

Wire Price Nominal at Pittsburgh

The market for wire products in the Pittsburgh district shows no improvement this week. Prevailing quotations are considered nominal, and reports of $1 concessions continue to be heard.

Tubular Goods Quiet

The market for tubular goods in the Pittsburgh district is unchanged and competition for attractive orders continues keen. Some boiler tube makers are rolling limited sizes of standard pipe, apparently in need of additional tonnage. A local gas company is in the market for 30 miles of 12-inch steel pipe.

(*For complete prices see page* 894)

METAL MARKETS

New York

May 12.

Copper.—Demand for refined copper continues dull but the tone today is a little firmer. Prices, however, in the absence of business, still are largely nominal. Leading first hands still hold for 14.37½c, delivered 30 days, but second sellers offer small quantities at 14.12½c, delivered 30 days, and less probably could be done. On a cash basis, electrolytic now may be quoted at 13.95c to 14c, New York. Prime casting continues to be quoted at 13.87½c, cash. Prime lake is offered in moderate quantities at 14.50c, cash, and in some cases, 14.50c, delivered 30 days, continues to be offered. The London standard market is stronger and closed today at £63 3s 9d for spot and £63 15s for three months, a gain of 7s 6d for spot since yesterday's close. Exports have been larger lately than during the first part of the month and since May 1 have totaled 14.141 tons, which is about normal.

Tin.—Fair inquiry and fair sales are reported by leading sellers, and on the whole there is a better feeling in the market and prices higher. Spot and May are held at about 33.75c, and June at about 33.87½c. The London market last Wednesday closed at the lowest of the year and the lowest since the summer of 1910. Spot last Wednesday went down to £148 10s. Since then there has been a recovery and today spot closed at £153 and three months at £155. Arrivals since May 1 total, 1,294 tons and afloat now is 1,300 tons.

Spelter.—This market is stronger and producers generally now are asking 5.15c for New York delivery of prime western brands in 50-ton lots. Some metal, however, still is available at 5.10c, New York. The demand is small.

Lead.—The leading interest continues to ask 3.90c as its New York shipment price on lead in 50-ton lots. Most of the independent producers are willing to meet this price. Demand is dull.

Antimony.—This market is dull and prices are unchanged from last week.

Chicago

May 12.

New metals are not being dealt in largely and prices remain much the same as has been the case for the fortnight past. Spelter is a trifle stronger than for the past week and tin is a shade lower.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 14.25c; casting, 14.25c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.00c; lead, desilverized, 3.80c; sheet zinc, $7.00, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 34.00c; Cookson's antimony, 7½c; other grades, 6c.

Lack of business in the old metals market, especially in copper and brass, has resulted in somewhat lower quotations while lead and zinc remain at the nominal quotations that have ruled recently. Tin, following prices of new tin, rules somewhat lower.

We quote dealers' selling prices f. o. b., Chicago, as follows:

Copper wire, crucible shapes, 13.50c; copper bottoms, 12.00c; heavy red brass, 11.75c; heavy yellow brass, 9.00c; No. 1 red brass borings, 10.50c; No. 1 yellow brass borings, 8.00c; brass clippings, 9.25c; lead pipe, 3.60c; zinc scrap, 4.00c; tea lead, 3.50c; No. 1 aluminum, 14.00c; No. 1 pewter, 23.50c; block tin pipe, 32.50c; tin foil, 28.00c; linotype dross 3c; electrotype dross, 3c; stereotype plates, 4.25c; stereotype dross, 3c.

From Railroads to Hen's Nests

Government Would Own All if Plans of Some Politicians Were Carried Out—Armor Plate Proposal Rejected

Washington, May 12.—Carrying $140,000,000, the administration's building program calling for two battleships, one to be built in a government navy yard; six torpedo destroyers, one seagoing boat, three coast defense submarine torpedo boats, to be built on the Pacific coast, and four submarines, the Naval Appropriation bill passed the house last Thursday by a vote of 201 to 106. Among those who voted against the two battleship program were Majority Leader Underwood and Minority Leader Mann. An amendment was also adopted to appropriate $200,000 to the yard which the secretary of the navy may select for the building of the ship.

The provision in the bill that the secretary of the navy be authorized to cause an inquiry to be made into a suitable site for and cost of an armor plate and gun forge plant was stricken from the bill. This action was done on a point of order raised by Minority Leader Mann, whose contention that it was new legislation was upheld by the Speaker. Chairman Padgett of the House Naval Affairs committee, has indicated in speeches on the floor of the house that he is not enthusiastic at all over the proposal of the government to build its own plant and made it plain that such a proposition should at least be thoroughly investigated before actual operations are begun.

There is a report that inserted in the bill when it goes to the senate floor, will be a provision that the government build its own plant, but whether this proposal could stand up as being in order is a question. Further, it seems unlikely that the senate is in favor of such a plan. That, however, is a mere observation, and cannot be confirmed.

Futile efforts of different radicals in the house were made to get through a provision for the government to build its own armor plate plant.

Having failed to get consideration of his amendment when offered to the bill that the commissioner of corporations inaugurate an inquiry to learn whether corporations furnishing armor plate or other materials have been or are engaged in a conspiracy to defraud the government as to the price or quality of materials, and offering a reward to any person furnishing evidence to that effect, Representative Cary, Republican of Wisconsin, has offered a resolution which is more sweeping, if anything, than was his amendment. The resolution asks that a special committee investigate "misleading reports which Mr. Cary claims certain chiefs of the Bureau of Ordnance of the Navy have filed with their superior officers and with congress as to armor plate. It is not thought the resolution will be passed.

Among those who urged erection by the government of its own armor plate plant was Representative Tavvenner, Democrat, of Illinois. Representative Dies, Democrat, of Texas, made a sharp comment on such a proposition. Strongly opposing manufacture by the government of its own armor plate, Mr. Dies spoke of the numerous bills which have been introduced looking to government ownership of various enterprises.

"There are gentlemen in this house," said Mr. Dies, "who are in favor of the government owning everything from railroads to hen's nests, and they imagine that all Democrats opposed to socialism, opposed to government ownership in all the activities of the country, are controlled by some special interest."

With considerable irony, he predicted that "presently some modern statesman will rise and propose that the government buy out the beef-packing business and go into the business of making pork sausage and canning liver."

"Why not?" he asked. "There is a beef trust, there is a navy. The navy requires beef, and without beef the armor plate would be practically useless."

Further along, Mr. Dies, speaking in the same sarcastic vein, inquired:

"Why leave anything to the individual in this country, if these modern Moseses of political economy are to be believed, and we are to lay aside the old democracy and the old republicanism based on the constitution and representative democracy? These government ownership proposals were spoken of as socialistic tendencies and false doctrines being taught to this country of the rights of labor and the rights of capital, and this miserable propoganda of paternalism and socialism that comes with the Dead Sea fruit of anarchy in its wake, offering to the stalwart democracy of this country as a substitute for our constitution and representative democracy under the constitution."

Both sides of the house applauded Mr. Dies.

Hampered

By Political Craze in Development of Pacific Coast

At the eighth annual convention of the United Metal Trades Association, held in Spokane, Wash., the reports of the various officers showed the association in a better condition as to numbers, finances, etc., than ever before. The report of the president deplored the fact that the development of the manufacturers on the Pacific coast is handicapped by the political craze that has seized the public, the unskilled employe in particular, for the enactment of restricting and regulating laws without any regard to their ultimate effect. The president also called attention to the fact that while the organization should continue its open shop it should take up such questions as "Accident Prevention," "Fire Prevention," "Freight Rates," "Industrial Development," "Industrial Education," etc. Members were present from Sedro-Woolley, Everett, Seattle, Tacoma, Spokane and Portland.

The convention closed with a banquet, at which time Mr. Ralston, of the Washington Water Power Co. of Spokane, delivered an interesting address on the water power prospects in eastern Washington and Idaho, and referred in his address to national legislation that is hampering the development of the western country. Mr. Reynolds, secretary of the Spokane Builders' Exchange, called attention to several initiative bills which are to come before the voters of the state November next and which if passed would work hardship to employers. He emphasized the need of organization.

Officers elected were: F. G. Frink, manager Washington Iron Works, Seattle, president; J. M. Fitzpatrick, manager Union Iron Works, Spokane, first vice president; Eugene Roberts, manager Puget Sound Iron & Steel Works, Tacoma, second vice president; A. M. Clark, manager Columbia Steel Co., Portland, third vice president; O. E. Heintz, manager Pacific Iron Works, Portland, treasurer and F. C. Porter, Portland, secretary.

Improvement is Shown

In British Pig Iron Market—Believed Bottom Has Been Struck on Prices

Office of The Iron Trade Review,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 1.

In the pig iron market there is a growing feeling that the bottom has been reached in regard to prices. The Cleveland market has shown a decided improvement, and the latest reports are very cheerful. Yesterday over three thousand tons were taken from stock, so that the amount in store is now below 100,000 tons, the precise figures being 95,592 tons. The increasing shortage of pig iron is stimulating business. Prices also are creeping up, yesterday's quotation there being 51s 5d ($12.58) for ordinary warrants. The shipments for the month were 128,000 tons, as compared with 102,000 tons in the corresponding month of last year. Consumers are gradually realizing that there is a shortage of pig iron and they are consequently pressing for delivery. Makers could accept forward contracts, but this, at present prices, they are determined not to do, and for the time being this shuts off business. In the hematite department, rates are being held very firmly, and there will be no concessions. At Barrow, business is quiet, but the low stocks and the fact that every pound of material is going into consumption enables makers to refuse concessions. Even in Scotland all the production is being sold, but it is said that owing to keen foreign competition, concessions will be made for good contracts. Undoubtedly, the improvement of the last week has stiffened the backs of smelters in all directions, and with coke prices steady, no more concessions are looked for in that department. Generally, the signs are more hopeful than they have been for some time past. The Derbyshire furnaces, as well as Lincolnshire makers, are asking advances of 6d (12c) to 1s (24c) for forward business.

Finished Iron and Steel

In the finished department, a gradual improvement has been noticeable since Easter. Orders are still for small amounts, but more of the mills are now able to keep in regular operation. Makers are not at all disposed to accept forward business at present prices.

Some nice orders have been booked for galvanized sheets, and generally that department has improved. The selling figures continue round about £11 2s 6d ($54.48), f. o. b.

The competition of Belgium is very keen, No. 3 iron being delivered in South Staffordshire at £5 13s ($27.66), competing with the lowest price iron made for nuts and bolts at £6 5s ($30.60). Latterly, however, even Belgium has been putting up signals of distress, and some Birmingham merchants have this week received an intimation that the present low quotations are strictly for immediate delivery.

In the west of Scotland work has become really scarce and some very large firms contemplate closing down shortly, unless the demand improves or costs can be reduced. Business has lately been done in ship plates at £5 15s ($28.08), less 5 per cent for Clyde delivery, a price which it is said involves an actual loss. There is, however, a very good demand for structural building. Somewhat to the surprise of the employers a number of the bridge builders have chosen the present juncture to demand higher wages; but the demand will, of course, be resisted.

Russian Trade Prosperous

Free Trade in Pig Iron Advocated to Relieve Shortage in Czar's Domain

(Specially Contributed.)

St. Petersburg, April 28.—Russia continues to be at its wits' end for crude iron. Prices are dearer everywhere for practically all descriptions of finished or half finished products, besides pig iron. The scarcity has become so acute in Odessa that some engineers' shops there have had to close down entirely, whilst others that are able to keep open will not commit themselves to any period at all for the delivery of orders. There appears to be no slackening in demand either from the government departments or from private houses; and the extraordinary activity prevailing in the building business this year all over Russia is bound to add to the difficulties in procuring supplies.

Want Duty Taken Off

Odessa engineers in their distress are petitioning the government to allow pig iron to come into the country free of duty, and there is little doubt that the government will be compelled to afford such facilities over a considerable period, for the time is apparently not yet within sight when the present inflation will begin to ease. Several new furnaces that have been lighted in South Russia do not appear to have eased the situation, which, though it is certain that without them the term famine which has been applied to the present scarcity for many months now would have assumed a much more critical meaning. The Russian iron industry is in a position of prosperity that the country has never before experienced, and which looks like enduring still for an indefinite period, although in other great iron producing countries stagnation is at the moment the normal condition.

More Demand in Germany

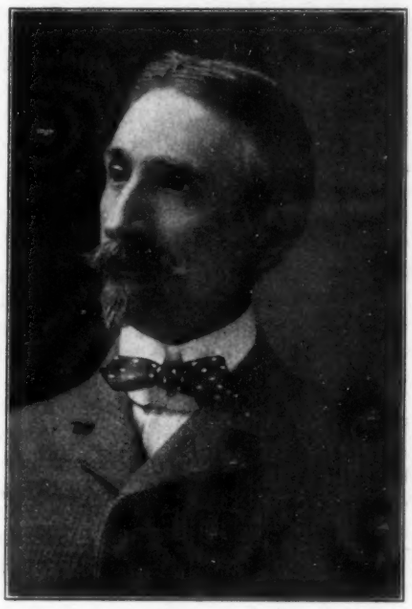
Berlin, April 29.—The home iron trade in Germany is quiet, but Westphalia reports something of a halt in the drop in finished iron and steel prices. There is a bigger demand for pig iron. The works prices for steel bars is now $23.12 to $23.61, but some merchant quotations have been lowered to meet competition by a firm outside the bar merchants' syndicate. This association has not succeeded in fixing up things with the Wesel-Emmerich concern about bars, sheets, hoops, etc. The wire rod syndicate has fewer orders on its books as compared with the beginning of the year. The sales bureau for gutter or pipes at Frankfort-on-Main mentions lower prices in response to competition. The figures have recently dropped from $41.37 to $43.80 to $36.52 and $38.94. There are competitive offers as low as $27.99.

Shipping Guide Free.—The April number of "Made in U. S. A.", a quarterly international trade magazine, edited at Chicago by R. L. Ardrey, contains a valuable export shipping guide showing all lines sailing from the United States and Canada, the direct ports they reach and the number of days each boat is out. This guide will be sent free to any manufacturer who so requests.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Henry Tanner Pratt, manager of sales of the American Steel & Wire Co. in the Cleveland district, has retired after a long and honorable service, and has been succeeded by Andrews T. Merriman. Mr. Pratt's service in the wire business extended over 20 years preceding the organization of the Steel Corporation with the Washburn & Moen Mfg. Co., at Worcester, and continued from 1901 until the first of this month with the American Steel & Wire Co. He was a guest of honor Saturday evening, Jan. 3, at the Chicago Athletic Club, when a dinner was given by the sales managers and department managers of the company. Mr. Pratt started a few days later for Florida, where he spent the winter, and recently returned to Cleveland.



HENRY T. PRATT,
Retiring Manager of Sales, Cleveland District, American Steel & Wire Co.

Mr. Merriman is a Chicago product, having been born in that city in 1872. He has been in the steel business about 12 years. After being connected with J. T. Ryerson & Son for four years, he entered the services of the American Steel & Wire Co., eight years ago, and has been located in Cleveland for five years as assistant to Mr. Pratt. He was educated at Rose Polytechnic Institute, Indiana.

C. D. Hollins is now representing the Black Products Co., Chicago, in the Pittsburgh district.

D. T. Williams, of the D. T. Williams Valve Co., Cincinnati, has returned from a two months' trip to the Pacific coast.

George G. Moody, assistant to the president, Joseph T. Ryerson & Son, has returned to Chicago after a brief visit to Excelsior Springs, Mo.

C. H. M. Atkins, president of the Warner Elevator Co., Cincinnati, has returned from a business trip to New York and eastern cities, which occupied about a week.

W. J. Richards has been elected president of the Reading Coal & Iron Co., succeeding the late George F. Baer. Edward T. Stotesbury has been made chairman of the board.

Oswald Lamasan has been elected secretary of the Vulcan Detinning Co., succeeding Frank E. Spier. The other officers were re-elected. Fritz Brose has been made a director of the company.

W. W. Warley, of the Bethlehem Steel Co., has gone to Chile to look after the steamship interests of that company in connection with the shipments of iron ore to be made from its Chilean properties.

Dr. M. G. Christie, president of the Otto Coking Co., 6 Church street, New York City, is expected to arrive in this country shortly on a business mission. He will be accompanied by high officials of the parent company in Germany.

H. C. Thomson, who has been connected with the Philadelphia office of Rogers, Brown & Co. as a salesman, has resigned to accept a position as salesman with Swayne & Mills, Philadelphia, dealers in pig iron, coal and coke.

Robert W. Hunt, of Robert W. Hunt & Co., Chicago, has been elected one of the vice presidents of the International Association for Testing Materials. The selection was made recently at a meeting of the council held in Turin.

Horace L. Haldeman has been elected president of The Pulaski Iron Co., Philadelphia, to succeed A. J. Dull, deceased. E. P. Borden was elected vice-president and secretary and treasurer, and Leonard W. Williams, assistant secretary and treasurer.

M. C. Turpin, member of the publicity department of the Westinghouse Electric & Mfg. Co., and one of the most active members of the publicity fraternity in the Pittsburgh district, was elected president of the Westinghouse Club at a meeting last week. The organization is composed of about 800 Westinghouse employes.

Tribute to Mr. Pratt

By Frank Baackes

Vice President and General Sales Agent, American Steel & Wire Co.

Henry T. Pratt, who has just retired as sales agent of the American Steel & Wire Co., Cleveland, has been associated with our company for about forty years and with the writer for the past seventeen years. Mr. Pratt is an exceptional man; a man of the highest integrity and honesty of purpose, and I regret very much that his health compelled him to retire. If the whole business community were composed of men of Mr. Pratt's caliber, business would be a pleasure. I cannot pay too high a tribute to the gentleman. We are holding him up as an example to the young men coming along who will follow us.

A. T. MERRIMAN,
Manager of Sales, Cleveland District, American Steel & Wire Co.

Low Point

Of Recent Corporation Order Book Again Reached

The order book of the United States Steel Corporation now is back to the low point in December, or before the January-February buying movement, when the tonnage awaiting rolling was the smallest since Nov. 30, 1911. The loss of shipments over new business in April, according to the announcement made May 9, was 376,757 tons against a loss of 372,615 tons in March, or a total shrinkage in the two months of 749,372 tons. The unfilled orders on April 30 were 4,277,068 tons, compared with 4,653,825 tons at the end of the preceding month.

A statement of the unfilled tonnage of the Steel Corporation showing the changes in tonnage and percentage by months since the plan of announcing monthly the business on hand was adopted, shows the following:

Date.	Total.	Change, tonnage.	Change, per cent.
Apr. 30, 1914....	4,277,068	376,757—	8.09—
Mar. 31, 1914....	4,653,825	372,615—	7.42—
Feb. 28, 1914....	5,026,440	412,760+	8.95+
Jan. 31, 1914....	4,613,680	331,572+	7.74+
Dec. 31, 1913....	4,282,108	114,239—	2.59—
Nov. 30, 1913....	4,396,347	117,420—	2.60—
Oct. 31, 1913....	4,513,767	490,018—	9.79—
Sep. 30, 1913....	5,003,785	219,683—	4.24—
Aug. 31, 1913....	5,223,468	175,888—	3.03—
July 31, 1913....	5,399,356	407,965—	7.03—
June 30, 1913....	5,807,317	517,005—	8.18—
May 31, 1913....	6,324,322	654,440—	9.38—
Apr. 30, 1913....	6,978,762	490,194—	6.55—
Mar. 31, 1913....	7,468,956	187,758—	2.45—
Feb. 28, 1913....	7,656,714	170,654—	2.18—
Jan. 31, 1913....	7,827,368	104,796—	1.32—
Dec. 31, 1912....	7,932,164	79,281+	1.01+
Nov. 30, 1912....	7,852,883	258,502+	3.40+
Oct. 31, 1912....	7,594,381	1,042,874+	15.33+
Sep. 30, 1912....	6,551,507	388,132+	6.29+
Aug. 31, 1912....	6,163,375	206,296+	3.46+
July 31, 1912....	5,957,079	149,773+	2.58+
June 30, 1912....	5,807,346	56,363+	0.98+
May 31, 1912....	5,750,983	86,983+	1.52+
Apr. 30, 1912....	5,664,885	360,044+	6.97+
Mar. 31, 1912....	5,304,841	149,359—	2.79—
Feb. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sep. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,900+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400,543	289,624+	9.31+
Jan. 31, 1911....	3,110,919	436,163+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sep. 30, 1910....	3,159,106	379,088—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—

To Build Sheet Plant

The Western Reserve Steel Co., organized at Niles, O., with a capital of $600,000, has taken steps to incorporate at Columbus, O. It has accepted a site from the Warren, O., board of trade and will build a sheet plant at Warren, just east of the works of the Trumbull Steel Co. The proposed sheet mills will consist of the following buildings: Six hot mills, three cold rolling mills, three roughing mills, a galvanizing department and a sheet metal department. The new company, it is proposed, will absorb the Sykes Iron & Steel Roofing Co., Niles, O., manufacturer of metal lathe. C. G. Thomas will be president and other officers will be determined later. Associated with C. G. Thomas in the organization are C. R. Thomas, Ira A. Thomas and S. J. Thomas.

Bobs Up Again

Armor Plate Project Restored by Senate Committee

Washington, May 12.—The Senate committee on naval affairs yesterday afternoon reported out the naval appropriation bill, which it took up last Friday following its passage in the House.

The provision authorizing the secretary of the navy to cause an inquiry to be made to the cost of and a suitable site for an armor plate and gun forge plant was restored in the bill. It was stricken out in the House when Minority Leader Mann raised the point of order that it was new legislation and therefore not germane.

The Senate committee struck out the provision that one of the two battleships shall be built in a government navy yard. The two battleship program remains, and both of them, according to the amended bill, will be built by private industries. It is understood that President Wilson caused the Senate committee to take this action. The committee also inserted a provision for a dry dock at Norfolk, Va., not to cost more than $3,000,000, of which $200,000 is made available at once.

Will Blow Out

Marquette, Mich., May 11.—The Marquette stack of the Pioneer Iron Co., a Cleveland Cliffs Iron Co. subsidiary, will go out of blast June 1 for an indefinite period. While there is some repair work to be done, the shut-down at this time is ascribed particularly to the discouraging condition of the market. The company is carrying some 20,000 tons of charcoal pig iron at its yards in Marquette, or about a half year's production for the plant. Sales have been slow for several months past and prices soft. The Gladstone furnace of the company was put out of blast some time ago for an overhaul and the Newberry furnace of the Lake Superior Iron & Chemical Co. will be closed for a few months for the same purpose.

Chairmanship

Created for Donner by Pennsylvania Steel Co.

Changes in the by-laws creating the position of chairman of the board were made at the annual meeting of the Pennsylvania Steel Co., at Camden, May 11. The directors will meet at Philadelphia, Friday, May 15, for organization, and at that time W. H. Donner, now president of the Cambria Steel Co., is slated for election to the chairmanship. Mr. Donner already is a director of the company, having been elected by the board the past week to fill the unexpected term amounting to about two years, of the late George F. Baer.

The election of Mr. Donner to the chairmanship of the Pennsylvania Steel Co. will complete the formalities whereby he becomes a leading factor in the affairs of the company and will bring about the closer working arrangement and eventually, it is expected, the consolidation of the company with the Cambria Steel Co.

The directors of the Pennsylvania Steel Co. re-elected at the annual meeting for a term of three years were Frederick W. Wood, of Baltimore; B. Dawson Coleman, of Lebanon, Pa., George H. B. Marten, of Camden, N. J., and Theodore N. Ely, of Bryn Mawr, Pa.

Called on Their Friend

Headed by a brass band, more than 1,000 men employed at the Homestead Steel Works of the Carnegie Steel Co. last Saturday called on A. R. Hunt, former general superintendent, who retired May 1, after 27 years of active service with the Carnegie company. Many who took part in the celebration were grey-haired veterans who were working at the plant when Mr. Hunt took charge. He and his successor, A. A. Corey Jr., made short talks.

Plant is Idle

The Bessemer plant of the Republic Iron & Steel Co., at Youngstown, O., is idle, but the open-hearth capacity is fairly well engaged. The company recently blew out its Hall furnace, Sharon, Pa., as noted, and may soon blow out one of the Hazelton stacks at Youngstown.

The Malleable Iron Fittings Co., Branford, Conn., has commenced the erection of a four-story and basement, brick, steel and concrete addition, 68 x 265 feet.

Ore on Dock

At Lake Erie Ports and Total Shipments to Furnaces

The amount of ore on Lake Erie docks May 1, according to statistics gathered by *The Marine Review,* was 5,920,157 tons, compared with 5,706,477 tons in 1913, an increase of 213,680 tons.

Total rail shipments to furnaces from Lake Erie ports during the winter season (Dec. 1 to May 1) were 3,341,519 tons, as against 3,790,691 for the corresponding period last year. The amount shipped to furnaces during the navigation season of 1913 was 35,747,800 tons. The entire movement of ore to furnaces over Lake Erie docks during the year ended May 1, 1914, was, therefore, 39,089,319 tons.

During April the mines sent forward 269,686 tons of ore, compared with 866,387 tons during April of last year.

Following are April shipments:

Port.	April, 1913.	April, 1914.
Escanaba	217,029	110,729
Marquette	37,494	.....
Ashland	53,481	40,838
Superior	252,875	62,338
Duluth	160,372	.....
Two Harbors	145,136	55,781
	866,387	269,686
1914 decrease		596,701

Buying Movement

May Follow Some Encouraging Signs in South

New York, May 13. (By wire.)—Reports from the south state that there are some indications of a buying movement in pig iron in that section. As reported, large buyers, including cast iron pipe makers, have been sounding out the situation quietly.

Ingot Iron

American Rolling Mill Co. Closes Important English Contracts

Two important license contracts were recently closed by the American Rolling Mill Co., of Middletown, O., with the Shelton Iron, Steel & Coal Co., of Stoke-on-Trent, England, and Richard Johnson & Nephew, Ltd., of Manchester, England, whereby the British firms are given the right to manufacture ingot iron under patents controlled by the Ohio corporation. The agreements were negotiated by George H. Charls, director of sales, and R. B. Carnahan, vice president and chief metallurgist, and the announcement of the execution of the contracts was made early this week by George M. Verity, president of the American Rolling Mill Co.

Ingot iron is made by a process which produces practically pure iron in commercial quantities in open-hearth furnaces and its manufacture was first undertaken by the American Rolling Mill Co. in 1906. At the present time, the Middletown works are turning out 166,000 tons a year. The technical features of the process and the plant of the American Rolling Mill Co. were fully described in THE IRON TRADE REVIEW Aug. 31 and Sept. 7 and 14, 1911.

Some Cheerful

But Conditions in Finished Lines Are Puzzling

New York, May 13. (By wire.)—Cheerful belief continues to be expressed in some directions that better times are in store for the steel industry soon, but close observers are unable as yet to scent any signs of a buying movement. The indifference of buyers is puzzling to large makers and the situation is not easy to analyze.

Early May business in tubes was poor, but inquiry is now active, especially from jobbers, and the month has a good outlook.

Wire continues to improve, especially specifications, but prices are weak. The sheet situation is unfavorable and tin plate not so good. Plates, shapes and bars generally are still backward and concessions under 1.15c, Pittsburgh, in plates and shapes continue to appear.

Bridge Company

Lowest Bidder on Wall for Docks at Panama

Washington, May 12.—The American Bridge Co. was the lowest of six bidders for 1,500 tons of structural steel for the quay wall for the Balboa docks at Panama, the tenders having been opened this afternoon in Washington by the Isthmian Canal Commission. The American Bridge bid was $60,600 for delivery of the material at Colon, Panama, and $84,600 for furnishing and erecting the material on the foundation to be supplied by the government. The next lowest bidder was the McClintic-Marshall Construction Co., whose price was $63,750 for furnishing the material. The Belmont Iron Works, Eddystone, Pa., submitted a bid of $72,900 for furnishing the material, delivery at Colon, and $87,900 for furnishing and erecting. The Pennsylvania Steel Co. bid was $74,400, delivery at Colon; the Riter-Conley Mfg. Co.'s bid was $77,100 for furnishing and $123,300 for furnishing and erecting, delivery at Colon, Ancon or Cristobal. The R. C. Hoffman Co., Baltimore, bid $70,500, delivery at Cristobal.

Bids were being opened late this afternoon for 4,000 tons each of plates and shapes for a transport and a supply ship. These bids are being opened at the navy department.

Steel Plant Activity

New York, May 13. (By wire.)—The United States Steel Corporation's ingot operations are unchanged at 65 to 70 per cent. Some of largest steel works are more than 70 per cent active and a few reach 80 per cent.

Sharon Steel Hoop Co. Will Expand

The Sharon Steel Hoop Co., Sharon, Pa., has secured additional property near Sharon; it contemplates erecting plant extensions, probably not more than six 70-ton open-hearth furnaces and a blooming mill. The company will keep its finishing mills on their present site, developing them when necessary.

W. T. Hardesty Dead

William Thomas Hardesty, aged 57 years, vice president and general manager of the Trumbull Steel Co., Warren, O., and builder of the first tin mill in the United States, died unexpectedly at his home on Mahoning avenue, Warren, Thursday, May 7. Mr. Hardesty had been for years one of the best known steel men and industrial promoters in the Mahoning valley. His last project was the Trumbull Steel Co., which he organized and built nearly two years ago. His health broke down while supervising the erection of the plant. Death was due to heart trouble and arterial complications.

Mr. Hardesty had been identified with the steel business in the Mahoning valley for 40 years. He was born in Lebanon, Pa. As a young man he succeeded his father as engineer of the old Falcon Iron & Nail Co., at Niles, O. In 1892 he superintended the erection and operation of the first tin mill in the country, at Niles, rolling the first sheets. He became district manager of the American Sheet & Tin Plate Co., and superintended the construction of several mills between 1893 and 1904. In 1904, with Jonathan Warner and a number of other capitalists, he purchased the Empire plant, Niles, and after doubling its capacity, sold it to the Brier Hill Steel Co., of Youngstown.

Belgian Prices

Are Competitive With American on Some Products

Amercan iron and steel producers have been much interested in determining what recognition they must give to Belgian steel works, as competitors for domestic business along and nearby the seaboard of this country, under the present schedule of reduced tariff duties. It has been appreciated that the geographical position of the Belgian works, added to the fact that these producers normally export all but a small portion of their output, may make them formidable contenders for the needs of home buyers in the more exposed districts.

Recent very complete quotations, giving base prices and extras, on important steel products, have been made by prominent Belgian makers upon inquiries from the Philadelphia district. These show that at the present time Belgian quotations undercut the prevailing prices of domestic producers at seaboard in plain and twisted steel bars, angles, beams and channels, but are higher than the prices now established for American-made plates. A premium generally is asked for open-hearth over Bessemer steel. The lists of extras asked invariably are lower than those established by the home producers.

The base prices quoted upon the various products per 100 pounds duty paid at Boston, New York, Philadelphia and Baltimore, and present prices of the same American products at Philadelphia, are as follows:

	Duty paid.	U. S. prices.
Mild steel Bessemer bars...	$1.1448	$1.30
Mild steel open hearth bars..	1.188	1.30
Cold twisted reinforcing bars	1.188	1.30
Bessemer angles	1.21	1.30
Bessemer beams and channels	1.214	1.30
Bessemer tank plates 5/16-inch and up	1.344	1.30
Open hearth tank plates, 5/16 inch and up.....	1.364	1.30

The foreign quotations include no discount or commission. It is provided that payment shall be made on New York, in exchange for shipping documents.

Extras in cents per 100 pounds, asked by Belgian mills on steel bars, as follows:

ROUNDS AND SQUARES.

Widths, inches.	Extras.
3/16	$0.2225
1/4	.14
5/16	.1125
3/8	.055
7/16	.0275
1/2 to 5.....	base
5 1/2	.1125
6	.1675
6 1/2	.2225
7	.28
7 1/2	.39
8	.445
8 1/2	.50
9	.56
9 1/2	.6125
10	.73
10 1/2	.78
11	.835
11 1/2	.9475
12	1.005

Rounds and squares from 3/16 inch up to and including 5/8 inch, and flats from 1/8 inch x 3/8 inch up to and including 5/8 inch x 1 1/2 inches are put in bundles of about 100 pounds or more; loose bars are cut with a margin of 4 inches under or over; bars in bundles are cut with a margin of 2 inches under or over.

The Belgian extras for cold twisted reinforcing steel bars are as follows:

Thickness widths in.	Flats 1/4 in.	5/16-in.	1/4-in.	5/16-in.	3/8-in. and up.
3/16	$0.28	$0.25	$0.195	$0.14	$0.055
1/2	.2225	.195	.14	.0825	.055
5/8	.2225	.195	.14	.0825	.055
3/4	.1675	.14	.1125	.055	.0275
1	.1675	.14	.1125	.055	.0275
1 1/4 to 1 3/4	.1125	.0825	.0275	.0275	Base
1 7/8 to 1 3/4	.0825	.0275	Base	Base	Base
1 to 1 1/2	.055	Base	Base	Base	Base
2	.175	Base	Base	Base	Base
3	.175	.055	Base	Base	Base
4	.2225	.055	Base	Base	Base
4 1/2	.2625	.2225	Base	Base	Base
5	.2625	.2225	.055	.055	.0275
5 1/2	.2625	.2225	.055	.055	.0275
6	.2625	.2225	.1125	.1125	.0275

5/16-inch	.25
1/4	.195
3/16	.1675
3/8	.085
7/16	.055
1/2	.0275
5/8 and 3/4	Base
1	.0275
1 1/4	.0275
1 1/2	.0275

For intermediate sizes, the extra for the next dearer size will be charged. One complete twist is given on a length of not more than 12 times the thickness of the bar. The margin in lengths is 2 inches under or over. Bars from 3/16 inch up to and including 5/8 inch are supplied in bundles of about 100 pounds or more.

The Belgian standard list of extras per 100 pounds on Bessemer rolled steel joists (beams) and channels are:

JOISTS, 3 TO 40 FEET LENGTHS.

Size.	Extra, cents.
3/16 to 17 3/4-inch	Base
17 3/4 to 21 21/32-inch	0.0325
21 21/32 to 24-inch	0.1025

CHANNELS, 3 TO 40 FEET LENGTHS.

3 1/2 to 8-inch	Base
8 to 15-inch	0.055

The allowance in length is 4 inches plus; in weight, 2 1/2 per cent plus and minus.

For open-hearth steel, an extra of 0.0325c per 100 pounds is asked. For lengths of joists and channels over 40 to 50 feet the extra is 25c per ton per foot or part of a foot; under 3 feet to 500 milometers, $1 per ton or part of a ton; under 500 milometers the extra is according to arrangement. The allowance in length of 1 1/2 inches plus, is 0.0175c; cutting within 3/8 inch plus or minus, 0.03c; cutting within 1/8 inch plus or minus, 0.055c. For holes up to and including 40 milometers diameter the charge is 2 cents each for ordinary round, punched in web; 4 cents each for ordinary round, punched in flange; 4 cents each for ordinary oval in web; 6 cents each for ordinary oval in flange; 2 cents each for ordinary drilled holes. The minimum charge for holing in any case is 0.50c a ton.

Worth Brothers

Low Bidders on Large Tonnage of Plates for the Navy

Washington, May 13. (By wire.)—Out of a large number of bidders on a supply ship and transport for the navy, involving approximately 8,000 tons of plates and shapes, Worth Brothers, of Coatesville, Pa., are lowest on 5,773 tons of plates, the aggregate price being $157,900. Naylor & Co., New York, were lowest on 800 tons of angles at $19,838, while the J. B. Kendall Co., Washington, was lowest on 782 tons of channels at $24,070. Other tonnages involving small individual lots were distributed among numerous bidders. Bids were opened late yesterday for delivery of the supply ship to be made at Boston and for the transport at Philadelphia, each calling for an equal tonnage.

Brass Founding Discussed

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held at the Fort Pitt hotel May 11, the question of "Brass Founding" being considered after the dinner. S. D. Sleeth, of the Westinghouse Air Brake Co., Wilmerding, Pa., opened the discussion in an informal way, considering the question from the standpoint of an operator. Following his talk, members discussed both the operating and selling features of the brass foundry business. The last meeting of the year will be held June 8.

Appointed Agent.—The Carnahan Tin Plate & Sheet Co., Canton, O., has appointed Ambrose Beard & Son, 1532 Dime Bank building, Detroit, selling agents in Michigan, also part of Ohio and Indiana. A. J. Maskery is now general superintendent of the works. The products are high grade steel sheets for automobile work and special enameling stock, also even blue polished sheets, tin and terne plate.

The Union Mfg. Co., New Britain, Conn., is adding a story to one of its buildings.

Electric Iron Plant By-Products

Description of Charcoal Retorts Operated by Noble Electric Steel Co., With Details of the Process

IN THE operation of its electric furnaces, described in THE IRON TRADE REVIEW, Sept. 25, 1913, the Noble Electric Steel Co., Heroult, Cal., uses charcoal, and to secure this material it had to construct retorts for utilizing wood cut in the vicinity. With these, to add a profitable side line which would lower the net cost of making pig iron, it has installed a modern by-product plant. It is equipped with 20 retorts supplied by the Union Iron Works, San Francisco, which operate on what is known as the Yost system, and 10 retorts from the MacKinnon Boiler & Machine Co., Bay City, Mich.

Each retort consists of a 5/8-inch steel cylinder, 20 x 5 feet, in a brick setting. It has a welded head on one end and a door at the other. The inside is fitted with an angle track to permit the entry of bolster cars or shells, on wheels, in which the cord wood is loaded. When this wood has been charged, the retort is closed and sealed to prevent the escape of gases. The MacKinnon retorts have side swing doors of their special design, and there are 25 charging cars made by the same company.

Underneath each steel cylinder is a furnace fired with crude oil. The oil and also water are sprayed in fine streams onto a hot plate within the furnace and volatilize as a gas of high caloric value which in burning gives an intense, concentrated heat. The carbon monoxide and other inflammable gases set free in the retort also are led into the furnace to be consumed and assist the oil fire.

Operation of Retorts

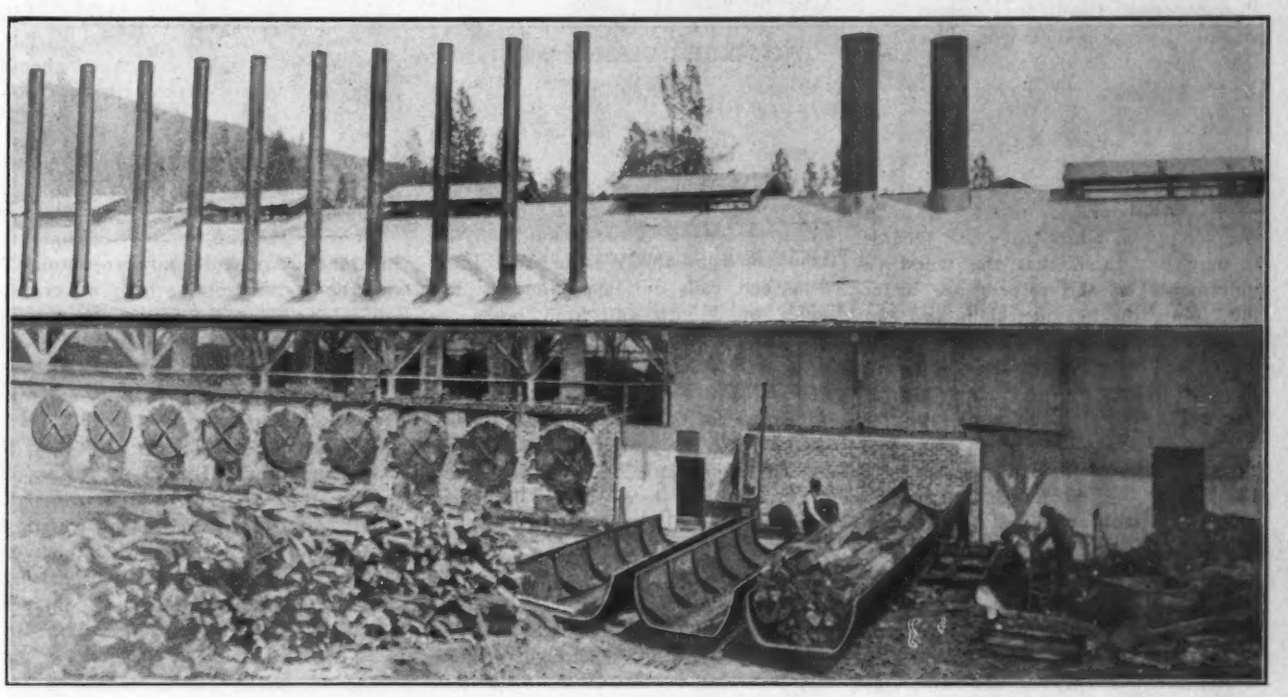
In the retort, as the heat converts the wood to charcoal, the volatile by-products, consisting primarily of various hydro-carbons and pyroligneous acid gas, are liberated and pass into a copper pipe which leads them to a condenser. The liquid tar, exuding from the wood, is drained into a tank.

The condensers consist of vertical steel drums, 10 feet high and 2 feet in diameter, containing water coils surrounding the pipes into which the volatilized substances pass. By the circulation of water, the gases are cooled and condensed; but instead of various products being taken off at different degrees of temperature, the gas mixture as a whole is reduced to pyroligneous acid, which is then collected in wooden tanks. From these it is pumped into a 5,000-gallon rectangular concrete tank and thence to the several stills as required.

Before being subjected to distillation, however, the acid is heated by steam. There are two 1,650-gallon copper stills, from which the various ingredients, wood alcohol, acetic acid, wood oil, turpentine, creosote and finally acetate of lime are taken. An alcohol still of 1,700 gallons further purifies and delivers into a large tank the wood alcohol for commercial use. There is an acetic acid still of earthenware, with coil of the same material, which has a capacity of 500 gallons. Two rectangular tanks, 5 x 8 feet, for the production of acetate of lime, which is the final product after all other ingredients have been removed, also are used for the creosote treatment of timbers. These are superimposed on steel tanks containing steam coils for heating the creosote.

In the production of the charcoal, 17 hours' firing is required to complete the charring process. The practice used in a smaller initial plant, the principle of which has been substantially duplicated in the enlarged one under description, is as follows:

The container shell is drawn out of the retort and taken to the cooling frame, this being necessary as the contents are red hot. The cooling frame consists of steel drums placed in the arc of a circle, in which the loading crane is centered. These



SECTION OF THE NOBLE ELECTRIC STEEL CO.'S 20-RETORT CHARCOAL PLANT. THE CHARGING CARS ARE IN THE FOREGROUND

drums contain water and the container is lowered into the drum, the water coming far enough up the side of the container to form a water seal and prevent air from getting into the hot charcoal and thereby setting it on fire. Streams of water are now played on the sides of the container and continued for 12 hours, until the charcoal has become cool. The container is then raised and moved over the opening in the top of the storage bin, and the charcoal is dumped into it.

A short distance east of the smelter building and close to the railroad track is the limekiln installation. This consists of a battery of four 7½-ton capacity kilns, built by the Mutual Engineering Co., San Francisco. These kilns are of the continuous type, in which oil is burned for fuel, and they are drawn down once every three hours. Fuel oil is run from cars into a sump, and thence is raised by a 5-throw Goulds pump, driven by a 5-horsepower induction motor, into a tank. The plant is equipped with two Cornish low-down marine boilers, which supply steam at 30 pounds pressure for the burners. The oil for the feed is pumped by Worthington duplex steam pumps.

The lime produced is used not only in the production of iron in the furnaces and acetate of lime in the by-product plant, but also is shipped as a commercial commodity.

The pumps and other machinery in and about the retorts, stills and limekilns are motor-driven, power being supplied from the works' substation through a 2,000-volt feeder line. This current is purchased from the Northern California Power Co.

The Wood Used

Considering by-products charcoal plants in general, without regard to the section in which they are located, it may be stated that the wood requirements of the retorts are exacting. Only the heaviest slabs and edgings, or regular cordwood, can be used, and any containing excessive doze or streaks of rot must be thrown out. The wood should be split so that it does not exceed 6 inches in thickness or 12 inches in width. It also must be hardwood and preferably seasoned for a full year before being used.

The difficulties and expense of getting this wood are considerable. They include scarcity of labor intelligent enough to make the proper selections; the necessity of constant, rigid inspection of the wood; the risk of fire during the year it must stay in pile for seasoning and the rehandling after seasoning.

The operation of the retort plant, while comparatively simple, requires a few highly skilled men and great care in the regulation of the operation.

The products per cord of wood average, for example, 50 bushels of charcoal, 11 gallons of crude alcohol and 160 pounds of acetate of lime, together with a varying quantity of tar or heavy oils.

Sale of Chemical Products

Unless the products are disposed of on season contracts and largely to the same customers year after year, the chemical products are somewhat uncertain of sale. Alcohol and acetate of lime, while capable of shipment for long distances, and even exported from both interior and coast plants as far as Japan, are chemicals for which the demand is limited and fluctuating. Wood alcohol has to compete with the more cheaply manufactured denatured alcohol; and in the case of acetate, a moderate increase of production often brings a sharp decline in price.

Charcoal, owing to its relatively low value and great bulk, and also its tendency to spontaneous combustion, cannot profitably be transported any great distance by rail, so that the proximity of an ore smelting furnace, whether blast or electric, is practically indispensable. The industry, therefore, preferably should be conducted auxiliary to other operations.

Westinghouse to Make Pipe

The Westinghouse Machine Co., East Pittsburgh, Pa., is transforming a section of its general foundry at Trafford, Pa., into a small cast iron pipe shop to fill an order. It is the first job of this kind taken by the Westinghouse interests, and calls for approximately two miles of 36-inch cast iron pipe. As briefly mentioned in the April 2 issue of THE IRON TRADE REVIEW, it will form a part of the New York City's gigantic water system originating in the Catskill mountains. The pipe will be laid on the bed of the Atlantic ocean 74 feet below the mean tide level, and will extend from Bay Ridge to Staten Island, a distance of 9,800 feet.

A casting pit, 70 feet long, 20 feet wide and 12 feet deep, is being sunk at one end of the foundry. Eight hundred and twenty-five sections, each weighing 4½ tons, will be cast in the usual manner in this pit. Each section will be 12 feet long with an inside diameter of 36 inches; the wall of the pipe will be 1⅝ inches thick. One end of each section will be enlarged to a diameter of 49⅛ inches to provide for a ball and socket joint. The other end of the section will be corrugated to hold the lead, which is poured in when the joints are fitted. The wall of the enlarged end will be slightly thicker than that of the body of the pipe and will be further reinforced by a heavy rolled steel hoop, 4 inches wide and ½ inch thick. It is expected that eight sections a day will be cast.

After the casting is completed, the sections will be carried from the foundry over the Westinghouse inter-works railroad, to the machine shops at East Pittsburgh, a distance of about five miles. Large lathes, mounted with special turret attachments, will be employed to bore the enlarged end of the sections into true spheres and the corrugated ends will be machined to proper size to insure tight fitting joints.

The sections will be shipped from the East Pittsburgh works to New York, where they will be loaded on barges and lowered into the ocean. The Merritt & Chapman Derrick & Wrecking Co., New York, which has the general contract for the water system, will have direct charge of laying the pipe. The ocean bottom will be dredged to provide a level bed for the pipe line. The line will be lowered, section by section, by means of a long trailing skid extending from one end of the barge to the bottom of the sea. The ball and socket joints will allow the pipe to bend about 10 degrees as it assumes its position in the sand. To make certain that the pipe will not rest on sharply projecting rocks, a diver will go down as each section is lowered into place. It will take the Westinghouse company four or five months to complete the contract, involving about 4,000 tons.

Warning Bell for Cranes

In a great many states the liability insurance companies are recommending the installation of bells on cranes which bells will ring when the crane is traveling, thus avoiding danger of accidents to workmen. In many cases a reduction in the liability insurance rate is made where these bells are installed.

The bells are 8 or 10 inches in diameter and are designed to ring directly off the power circuit which is as a rule 220 volts direct current. Bells can be obtained, however, for 110 or 220 volts alternating current, or 110 volts direct current. The Menominee Electric Mfg. Co., of Menominee, Mich., has developed a bell especially adapted for this class of work.

Remodeling Plant to Save Money

How a Saving of 30 Per Cent on New Plant Investment Was Obtained by the Marting Iron & Steel Co.

FOR SEVERAL YEARS past, proprietors and managers of merchant furnaces situated in southern and central Ohio have been confronted with the problem of insufficient and incompetent labor. These conditions have applied particularly to the charging and handling of the raw materials from cars and stock piles to the furnaces. A high wage scale has naturally resulted, and, coupled with the poor quality of the help, it has made apparent the desirability of installing stock charging and labor-saving devices. Apparatus of this nature has, heretofore, been the exception rather than the rule at the plants of the Hanging Rock district, and, therefore, a most attractive return on plant investment was shown to be possible.

The Marting Iron & Steel Co., Ironton, O., was among the first to realize and take advantage of the possibilities incident to a simple and inexpensive stock charging installation at two of their plants in Ironton. As is usual when improvements are made which were not contemplated in the original layout of a plant, the reconstruction involved problems that required special consideration and treatment.

The Etna plant (Fig. 1) comprised two alternate stacks with a connecting platform leading to a double vertical hoist. These stacks, as originally built by English engineers, had vertical shells of very light iron. It was decided to eliminate the alternate principle of operation and entirely reconstruct one of the stacks on modern lines. With this in view, one of the furnaces was equipped with a new shell of ⅜-inch steel plate in 1910; the other stack remained as originally built.

To equip the modern stack with a skip, it was necessary to lay off the center line of the skip bridge at 10 degrees with center line of the furnace in order to clear the hot blast stove located between the furnace and the stock house. Old wooden trestles, three in number, extended in a direction parallel to the center line of the two stacks. A new double track trestle with stock bins was constructed in line with the old wooden trestles, between them and the furnace, running through the old stock house, which was removed to accommodate it.

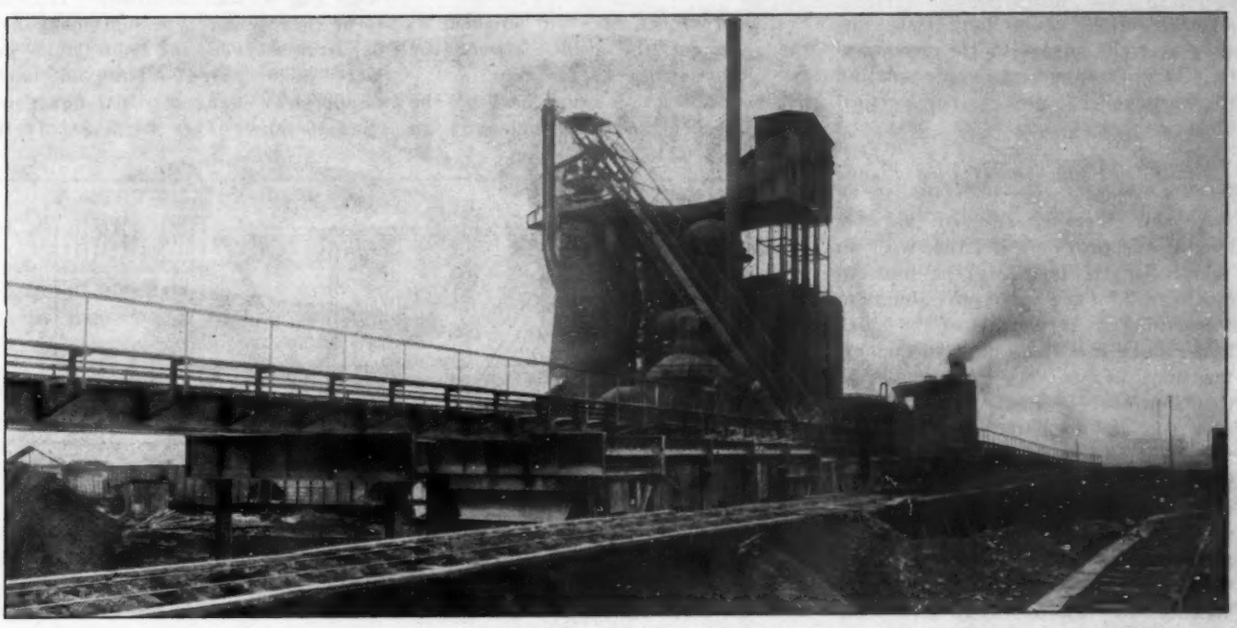


FIG. 1—THE REMODELED ETNA PLANT

Trestle Layout

For handling the ore, as far as possible directly from the old trestles, the new trestle was constructed within working distance for a locomotive crane from the first old trestle. The ore track on the new trestle adjoins the first old trestle. On this ore track the transfer car operates. With the aid of a locomotive crane, this car, therefore, commands all the reserve ore under the two tracks of the new trestle, all the ore on the first old trestle adjoining the new trestle and practically 50 per cent of all the ore under the second old trestle. The ore on the third old trestle and the remaining 50 per cent of the ore on the second old trestle can be loaded into a transfer car by handling it twice with a locomotive crane; or it may be loaded direct into hopper cars from the old trestles and switched over the bins.

At the Etna plant, the new alternate stack was available for immediate reconstruction, and it was planned that the older stack would be maintained in blast during part of the reconstruction period. At the Ironton plant, the plan was to keep the furnace in blast continuously throughout the entire construction period and only add to the previously existing layout, trestles and bins to be used in connection with hand filling, leaving the installation of a complete automatic filling apparatus until a later date.

The ore yard at the Ironton plant is in many respects similar to that at the Etna plant, and the same bin filling scheme was adhered to. However, the future skip will be con-

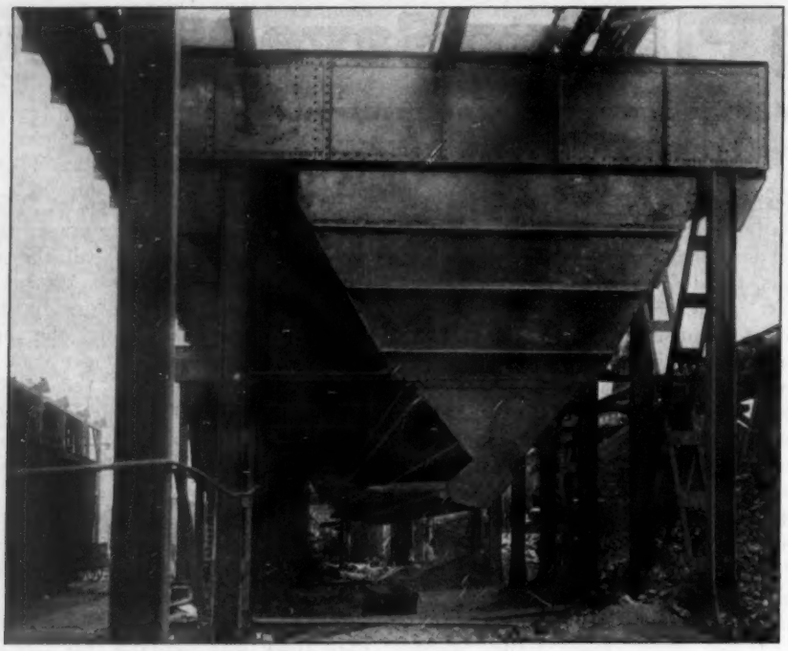


FIG. 2—BAKER SUSPENSION ORE AND STONE BINS

structed on the center line of the furnace at right angles to the new trestle, this arrangement contemplating the removal of the present vertical hoist.

Details of Equipment at Etna Plant

A new steel trestle of variable height was provided at Etna, with an overall length, including the bins, of 510 feet. A new concrete abutment approximately 14 feet above the stock house floor level was built to support the ends of the new trestle. From the abutment a single track trestle was run for a distance of approximately 50 feet, at which point a switch was provided and double-track construction carried to the point of connection with the coke bin. Beyond the coke and ore bins, a double-track trestle was provided for an additional distance of approximately 275 feet. The height of trestle measured above stockhouse floor level at the abutment is 14.0 feet and 23.58 feet at the first bent of the coke bin adjacent to the abutment, the grade between the two points being 4.2 per cent.

Eleven ore and stone bins of the Baker suspension type, each with an average capacity of 110 tons of Mesabi ore, were provided. The bins are spaced 12 feet center to center, and their average height is 25 feet, measured from the yard level to the top of the track rails. The approximate average width is 20 feet. The Baker type of bin construction as adapted to this installation was illustrated and described in THE IRON TRADE REVIEW, Oct. 23, 1913.

A double discharge coke bin 60 feet long, spanning the two tracks of the steel trestle and having an average height of approximately 24 feet, was provided. The bin was constructed with sloping bottom sides, converging to two oppositely located discharge doors provided with chutes and gates, the location of the chutes being such that materials may be discharged directly into skip cars. The bin is supported by four steel bents which also support the railroad tracks.

Transfer Car

An electrically-operated 60,000-pound transfer car, the general construction of which is in accordance with Fig. 4, was furnished. This car is of the McKee type, but many new departures over the old style car were incorporated. The old flared hopper was changed to flat hexagonal shaped sides. The tripping of the hinged discharge doors is accomplished by means of levers and bell cranks, located on center line of hopper, which in turn are actuated by means of a system of shafting and bevel gears leading to hand wheels in the operator's cab. Due to the fact that this car will at times have to be operated over a 4¼ per cent grade, it was necessary to fit it with two high power low speed motors. Two Westinghouse commutating pole mine type motors of 43 horsepower at 300 revolutions per minute were installed on this car. To further increase the tractive effort, 26-inch wheels were used on the two sets of standard M. C. B. trucks. Collector shoes attached to the car gather their power from two 20-pound T-rail conductors, running the

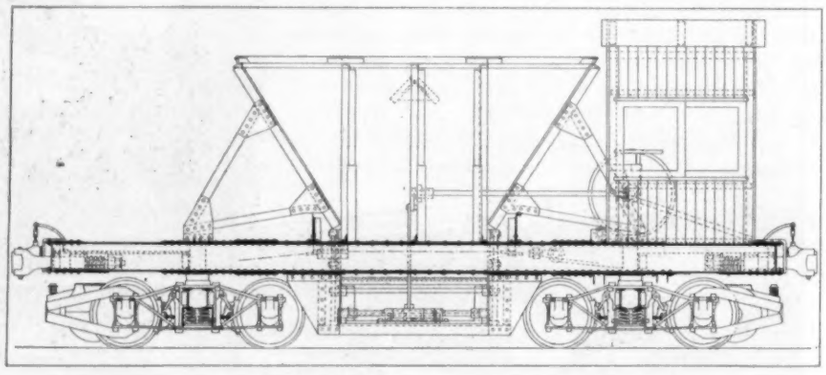


FIG. 4—ELEVATION OF 30-TON TRANSFER CAR

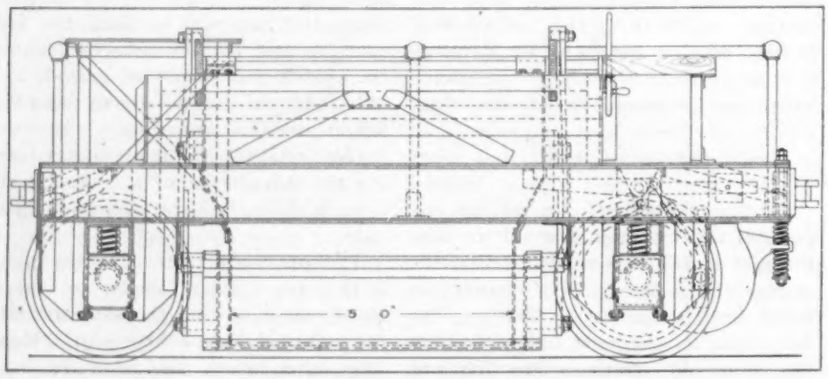


FIG. 3—ELEVATION OF SCALE CAR

entire length of the trestle. The car is of steel construction throughout.

An electrically-operated scale car of the McKee standard design, Fig. 3, with a hopper capacity of approximately 80 cubic feet, was provided. This car is mounted on two pairs of axles and is provided with a Westinghouse series wound 220-volt 25-horsepower direct current crane type motor.

The hopper of the scale car is supported by a series of pivotally mounted beams so connected to a Miller type beam box containing scale beams of 2,000 pounds capacity as to enable separate weighing of the various materials entering into the furnace burden. This car is provided with a hand-operated counterweighted bottom discharge door and also with a complete system of foot-operated band brakes. Power is collected for this car by means of two short trolley poles making connection with trolley wires hung underneath the bins.

A 15-ton steam-operated locomotive crane, designed by the Brown Hoisting Machinery Co., was furnished in connection with the general contract. This crane was provided with a 24-cubit-foot Brown grab bucket.

Double Track Skip Bridge

The furnace was equipped with a double track structural steel skip bridge of through type construction, rigidly supported at its base and having pin connecting support at the furnace platform. This bridge has an overall length of 160 feet and a width of 13 feet between the centers of the outside girders.

The skip pit is constructed of concrete with a front, sloping side which is of the same inclination angle as the skip bridge. It forms a support for ties carrying rails which are a continuation of the rails on the skip bridge. This pit extends a sufficient depth below the skip cars to be filled either from the coke bins on either side of pit or from scale car track hoppers located over the skip pit.

The stock is delivered at the furnace top to a McKee distributor which is actuated by a 10-horsepower series wound Westinghouse motor, automatically controlled by top and bottom limit switches and an electric controller of the six-station, six-skips per station type.

A new top plate ring was riveted to the old top ring; a new gas seal, bell beams, structural steel gallows frame, and top platform was also constructed. A hand operated jib crane was installed on the furnace platform. The old hopper and large bell were re-installed.

Self dumping 110 cubic feet skip cars are used. They are controlled by a 14 x 14-inch double drum steam-operated hoist engine of the Otis Elevator Co.'s standard design. This engine is located in a brick and steel engine house underneath bottom of skip bridge. An electric power plant for furnishing light and power requirements was installed.

The Ironton Iron Co. Plant

The improvements at the Ironton Iron Co. plant of the Marting Iron & Steel Co. were more limited in scope than at the Etna plant, but in making the plans provision was made for the possibility of later installations of a more comprehensive nature. At this time only trestles, bins, locomotive crane and transfer car were installed, the furnace to be filled from bins with hand buggies.

The plant was equipped with a bin system practically the duplicate in

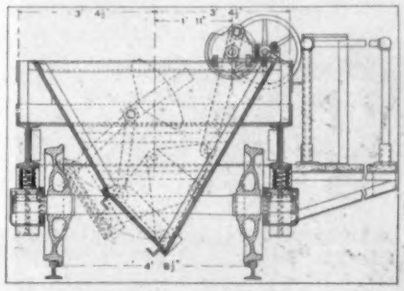


FIG. 5—SECTION OF SCALE CAR

capacity of the Etna furnace installation. The arrangement of the bins was altered somewhat to make a shorter haul for the ore and limestone. This plant is better adapted for this purpose, as there were no limitations as in the case of the Etna plant where the coke bin is on the end of the system.

The double discharge coke bin was located in the center of the bin system and on the center line through the furnace. The coke bin was built for discharge into skip cars to be installed later, but was arranged with false bottoms and temporary quadrant gates to enable temporary filling into hand-operated coke buggies.

A steel trestle of variable height was provided for supporting the tracks to the bins, and a trestle of similar construction was extended beyond the bins to enable the storage of ore. Beginning with the concrete abutment, the trestle construction is such as to support a single track for approximately 200 feet, at which point a switch is provided and double track construction was carried to the point of connection with the ore bin. Beginning with the outside bent of the ore bin farthest removed from the abutment, a double track construction was provided for a distance of approximately 250 feet. The total length of the trestle construction, including both single and double tracks, is 620 feet. The height of the trestle measured to the top of rail is approximately 12 feet at the abutment and 23 feet 6 inches at the first bent of the ore bin adjacent to the abutment, the grade of the tracks between the points mentioned being approximately 3.3 per cent. Eleven ore and stone bins of the Baker suspension type were provided in connection with the Ironton installation. The end view of the bin construction is shown in Fig. 2 and in all principle dimensions these bins agree with those at the Etna plant.

An electrically-operated transfer car of McKee design and of the same general construction as described above for the Etna plant was provided for the transfer of stock at the Ironton plant. A 15-ton crane and grab bucket was also furnished by the Brown Hoisting Machinery Co.

The Ironton furnace was maintained in constant operation during the entire period covering the reconstruction operations. Interference with furnace operations was at no time serious, nor was it necessary to make any shut-down for changing over from the old charging methods to the new system.

It has been demonstrated during a four months' period of operation that the yearly savings will be at the rate of 30 per cent on the new plant investment at the Etna plant where the advantages of the complete automatic apparatus prevail.

The general contract for the complete construction was awarded to Arthur G. McKee, engineer, 1301 Rockefeller building, Cleveland. The Variety Iron & Steel Works Co., Cleveland, was given a sub-contract for the steel work at the Etna plant, and a similar contract for the Ironton plant was awarded to the Riverside Bridge Co., Martins Ferry, O. The officers of the Marting Iron & Steel Co. include H. A. Marting, president and general manager, and E. O. Marting, vice president and treasurer.

Reports from Malone, N. Y. announce the discovery of large beds of zinc-bearing rock in the town of Edwards, in St. Lawrence county, N. Y. It is said Philadelphia interests have control of the deposits.

For the Mill Workers' Children

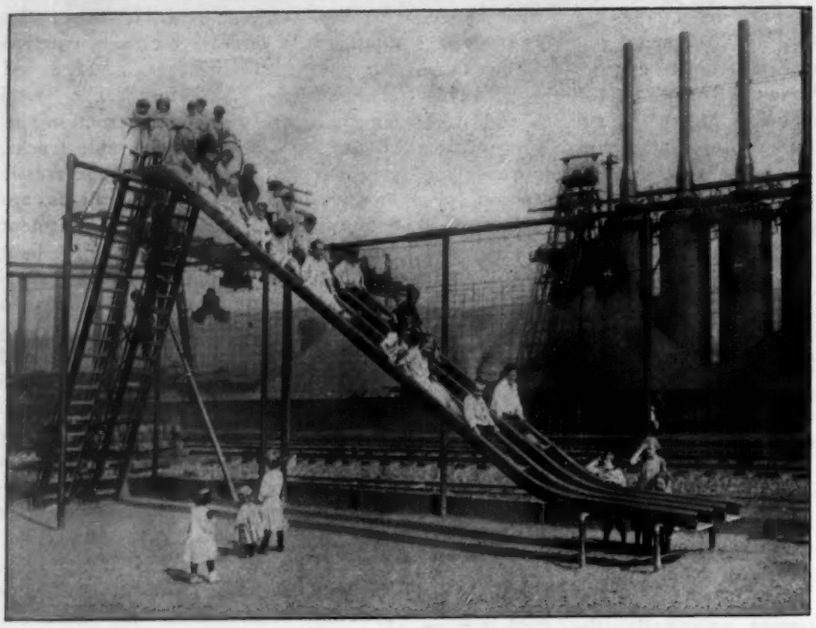


Fig. 1—A slide near the mills where their fathers toil

STURDY, LOYAL intelligent employes form the greatest asset that any corporation can possess. Far-sighted industrial managers appreciate this and plan not only for the present, but for the future. If the children of today are healthy, happy and provided with suitable opportunity for vigorous play, the workers of tomorrow will not fail at their tasks. Realizing this, and with an appreciation of the moral obligations of a large industry to the community, many important steel companies have fitted out playgrounds near their works. A few of them are illustrated on these pages. In many cases, the playgrounds are in charge of competent adult supervisors. It is coming to be understood that although a certain spontaneity in play must be preserved, its safety, efficiency and value are all promoted by wise supervision. In the interests of the race, the adults of each

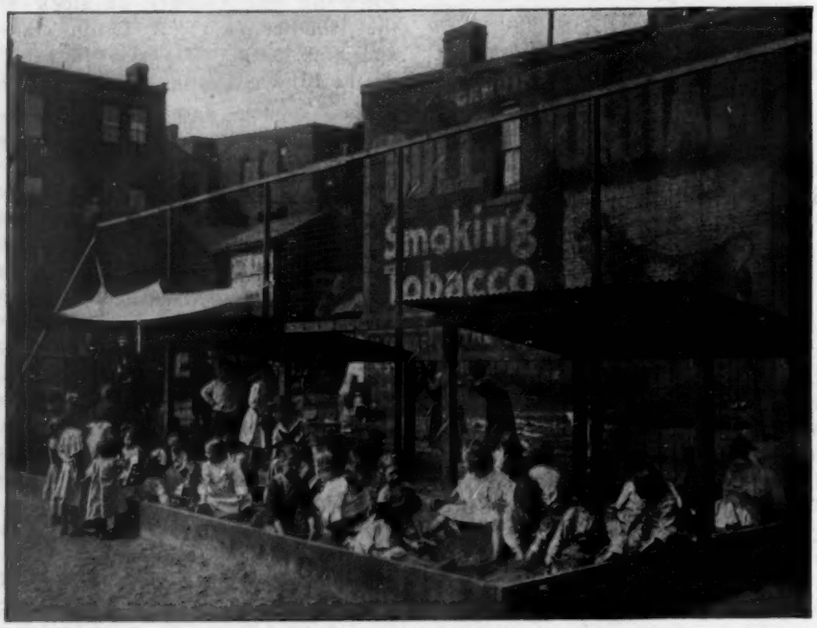


Fig. 2—A shaded playground provided by the National Tube Co.

Fig. 5—Carnegie Steel Co.'s playground

Fig. 3—Maypole dance at Lackawanna Steel Co.'s playground

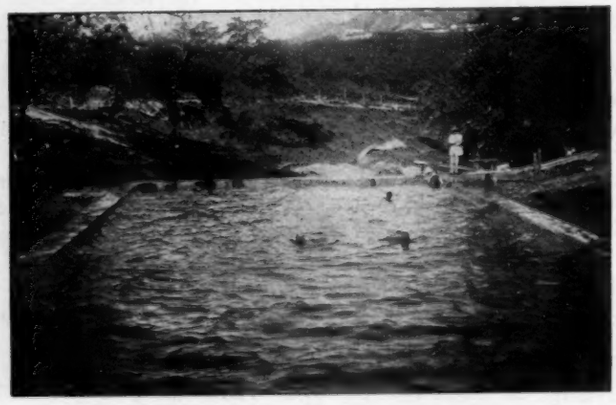


Fig. 4—Swimming pool near Cuban Iron Mines

Playgrounds Near Steel Plants

generation owe it to the young to provide facilities for play.

Fig. 1 shows a portion of the Jerome street playground of the National Tube Co. at McKeesport, Pa. It is situated in a narrow street or alley in the most congested district of the city, near the street car and railroad tracks. The average daily attendance is 200. The playground not only affords suitable opportunity for recreation, but keeps the children off the car tracks and has materially reduced accidents.

Playgrounds are not necessarily expensive. The equipment for the Cokeburg playground of the Lackawanna Steel Co. cost $118.02, while that for another playground near a large steel plant cost $120.33. For the photographs used herewith we are indebted to the American Iron and Steel Institute.

Fig. 6—Apparatus for youthful acrobats

Fig. 7—Playground and wading pool near Birmingham, Ala.

Fig. 8—The steel corporation provides adult supervisors for its playgrounds

Fig. 9—A base ball field in summer and skating rink in winter near the American Bridge plant at Gary

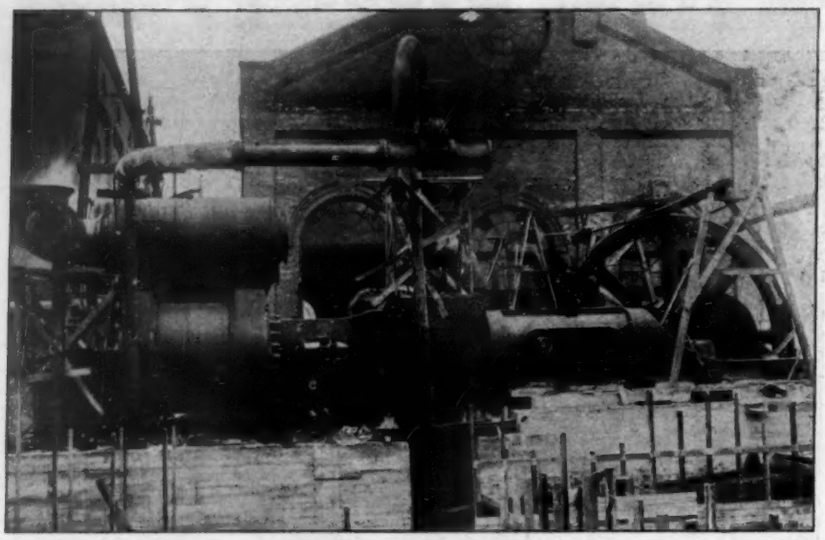


FIG. 1—INSTALLING BLOWING ENGINE AT WOODWARD, ALA.

Erecting Engines Under Difficulties

The two new blowing engines recently built for the Woodward Iron Co., Woodward, Ala., were erected and placed in operation before the building to house them had been constructed. These engines, each weighing 900,000 pounds, were built by the Mesta Machine Co., Pittsburgh, in record-breaking time. The first engine was built in 38 days, while both were completed within 59 days. The high pressure steam cylinders are 48 inches in diameter, the low pressure steam cylinders 84 inches in diameter, with 84-inch air cylinders and 60-inch stroke. They were described in the Jan. 22 issue of THE IRON TRADE REVIEW.

On Tuesday, Dec. 23, word was received by the Woodward Iron Co. that the first engine was being shipped from the Mesta plant. The foundation was not prepared as it had been expected that a much longer time would be required to complete the engines. The ground was covered by a large cinder pile, but as soon as the message was received, work was started and within six days the foundation was completed and the first casting in position.

No overhead cranes were available for erecting purposes and it was necessary to resort to unusual methods in order to assemble the engines with the desired speed. A track was laid at the sides and ends of the foundation and a 25-ton railroad crane with a 40-foot arm procured. The difficulties encountered during erection are shown by the method of moving the crane. To get from one end of the foundation to the other, a distance of a few yards, it was necessary for the crane to travel a distance of two miles.

In order to place all extra heavy pieces, a skidway of heavy rails was improvised from the car to the foundation. Heavy castings were skidded into position above the foundation and lowered by jacks.

To facilitate the erection of the air lines to the furnace, the air cylinders and receivers were placed in position as soon as possible. However, after this was done, it was impossible to use the one yard crane, because of interference with the receiver. An old crane with a useless boiler was pressed into service and connected to a live-steam line. A cableway was strung from this crane to one placed at the opposite end of the foundation and the valves and other parts handled without striking the tops of the receivers. When the pistons were ready to be placed it was impossible to get close enough to use the cranes. The pistons, therefore, were put on blocks and rolled into position.

When the first engine was started the available steam pressure was 60 pounds. Before operating the second engine some of the old engines were shut down and by further changes the steam pressure was raised to 120 pounds. The first engine operating at 60 revolutions per minute, is used for blowing a new 500-ton blast furnace. After starting it ran for seven days without stopping, when it was shut down a few hours for small adjustments.

The foundation for the second engine could not be started until the complete erection of all heavy parts of the first engine. As soon as the last large piece was in place, the railroad tracks were moved and the foundation for the second engine begun.

The engines operated in the open air for three weeks. During this time there were several rains and at one time a snowfall of three inches. The boiler house was located near the engines and cinders from the ash heap were blown over them from time to time. This was eliminated to some extent by stretching canvas in front of the engines. As quickly as possible a small shed was erected to protect the engines from the weather until the new power house could be built. The engines operated satisfactorily under these severe conditions.

The Mesta Machine Co. has received an order from the Woodward Iron Co. for two more engines to be exact duplicates of the ones just completed. The Andrews and Hitchcock Iron Co., Youngstown, O., also has ordered two of these engines, and they now are being built at the Mesta plant.

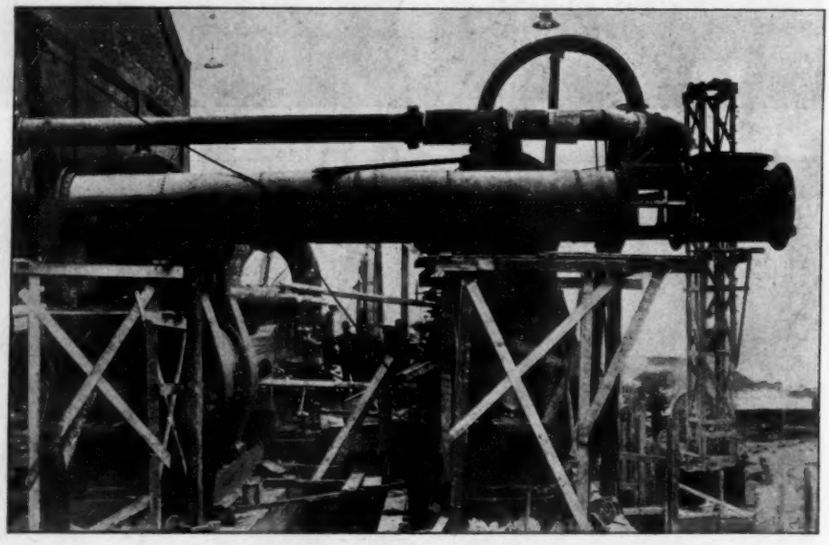


FIG. 2—ANOTHER VIEW OF ERECTING OPERATIONS

Riter-Conley Leetsdale Shops

How a Large Combined Plate and Structural Shop is Operated With the Aid of Many Special Labor Saving Machines

BY THE recent addition of two large bays to its already extensive plant at Leetsdale, Pa., the Riter - Conley Mfg. Co., of Pittsburgh, now has one of the largest combination plate and structural shops in the country. The new bays have been equipped to fabricate bridges, buildings, transmission towers and similar work. They add about 50 per cent to the floor area of the shop. The Leetsdale plant turns out a great variety of work, including plate fabricating of all kinds, tanks, vats, gas holders, etc., hot metal mixers, blast furnaces, hot blast stoves, large riveted pipe, buildings, bridges, line towers, steel boats and barges. The company specializes, however, on blast furnace work, oil tanks, gas holders, complete gas works equipment and transmission towers. Some of the largest blast furnace installations in the country, including that at Gary, have been constructed by the Riter-Conley company, which also built one of the largest gas works in the country at Astoria, N. Y. The latter plant has a capacity of over 12,000,000 feet of illuminating gas in 24 hours.

The business was established by James Riter early in the civil war period, at 55 Water street, Pittsburgh, and consisted of a small shop equipped to take care of a general plate and tank business. It was largely through the efforts of the late Thomas B. Riter that the reputation of the firm was established. He was a brother of James Riter. The firm was first known as Riter & Conley, later as the Riter-Conley Co., and about 16 years ago was incorporated under the name of the Riter-Conley Mfg. Co.

From its inception the business grew

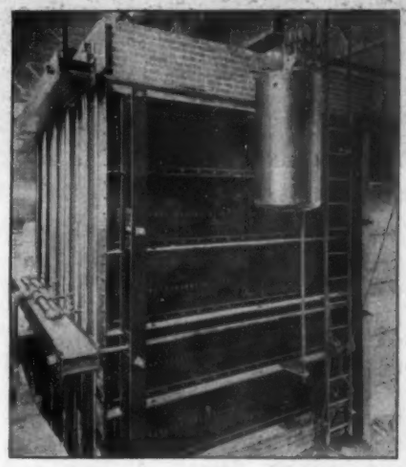


FIG. 1—ANNEALING FURNACE

rapidly, and the first move was to build additional shops on Ferry street, Pittsburgh; later a structural shop was established on Preble avenue, North Side, Pittsburgh, and then a plot of 70 acres was secured at Leetsdale, which is one of the numerous suburbs of Pittsburgh, located 15 miles west on the Pennsylvania Lines. Upon this tract is now located all the plant and general offices of the company, the Pittsburgh and North Side property having been disposed of and the works transferred to Leetsdale.

The advantage of the present location, in addition to a reasonable value for real estate, is the proximity of the Conway freight yards of the Pennsylvania railroad, where through trains for both the east and west are made up and an abundance of cars is always available. The Pennsylvania has now an extensive system of tracks into the works, and the company has its own switching equipment. A frontage of 1,400 feet on the Ohio river gives shipping facilities, in conjunction with the railroad that approach the ideal.

The present plant, aside from the office, power house, and galvanizing department, is all under one roof and covers an area of 360,000 square feet. The plant is divided into six bays, ranging from 77 feet 3 inches to 85 feet 6 inches in width, and are known as shops one to six, inclusive. They are lighted by abundant window space in the walls and roof, which make artificial light unnecessary. The building extends northeast by southwest, the receiving yard being located at the northeast end and the shipping yard at the southwest end. The general layout is such that work prog-

FIG. 2—PLATE FABRICATING DEPARTMENT AT LEETSDALE PLANT OF RITER-CONLEY MFG. CO.

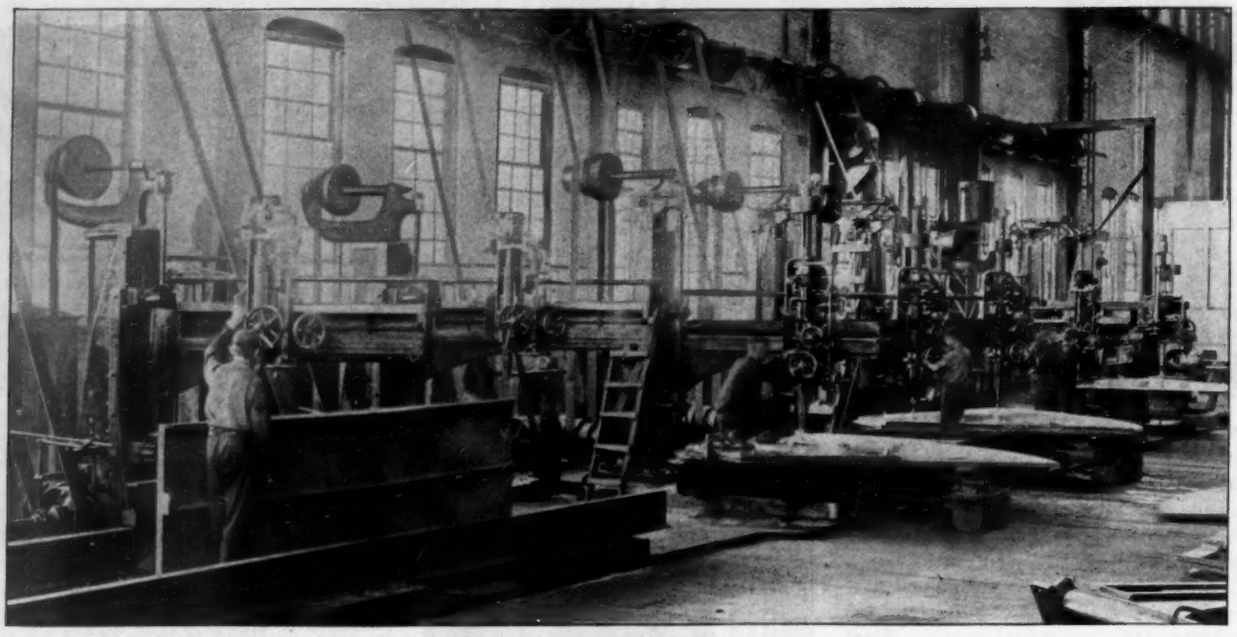


FIG. 3—DRILL PRESSES IN THE GAS HOLDER DEPARTMENT

resses through the shop in a straight line. The receiving yard, Fig. 7, is equipped with a number of locomotive cranes. In the shops sixteen traveling cranes have been installed, supplemented by numberless small cranes that serve the various machines. All the power is electric, the current being generated in the company's power house by gas engines using natural gas and a remarkable feature of the plant is that there is no coal used except in the blacksmith fires.

Shop No. 1, Fig. 2, covering an area of 77 x 635 feet, takes up one bay of the main building. This in conjunction with No. 2 shop, 85 x 638 feet, is devoted mainly to the blast furnace, tank, pipe work and miscellaneous plate fabrication. The tool equipment is very complete and appropriate for the purpose. The material enters at the north end, passes first through the shearing and punching machines and then it goes on the assembling and riveting floors. A long rack punch with automatic feed for punching holes on each side of a plate has been installed, which will handle plates 32 feet long. This machine, designed by the Riter-Conley engineers, may be set to punch holes at any predetermined distance apart. A multiple punch, Fig. 9, is provided for punching ends of tank and pipe plate. This machine has a capacity for punching one hundred ¾-inch holes in ¾-inch plate, 8 feet wide, at one stroke. There is a combination multiple punch and shear, a Long & Allstatter bull-dozer for bending bars and angles, and a Long & Allstatter punch and shear. A special machine is provided for scarfing plate cold. For bending plates a set of 21-foot horizontal bending rolls, Fig. 11, has been provided and a set of vertical rolls can take care of plates 8 feet in length by 1¾ inches

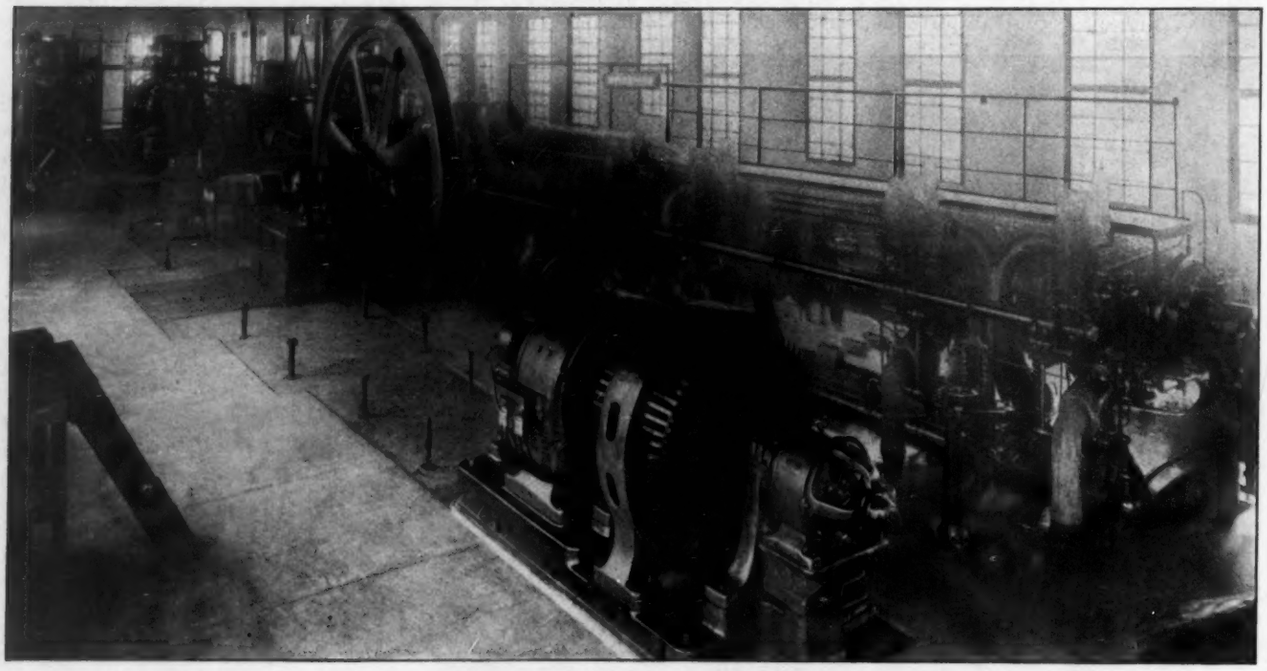


FIG. 4—A PORTION OF THE POWER HOUSE, SHOWING ENGINES DRIVEN BY NATURAL GAS

FIG. 5—GALVANIZING DEPARTMENT AT LEETSDALE PLANT

in thickness. A Niles-Bement-Pond 35-foot planer is installed in this department and is one of the largest ever built. This machine is driven through a large spur gear reduction by a 100-horsepower motor. The pipe-bending rolls have a capacity of bending pipe 90 inches in diameter. The plate drilling department in No. 1 shop contains six radial drills with 6-foot arms, three being of the Bickford type and three others were built by Prentiss Bros. The equipment also includes the usual array of heavy bull riveters. The largest of these is designed to rivet pipe sections 30 feet long and 7 feet in diameter, with a continuous butt strap assembled complete. Some of the tank work is welded and for this purpose there are provided two heavy oxy-acetylene welding devices; one was furnished by the Linde Air Products Co. and the other designed by the Riter-Conley Mfg. Co.

Rivet Making Machines

The company makes many of its own rivets and for this purpose the rivet making machines are installed in an annex to No. 1 shop, as shown in Fig. 6. The cold header machines were furnished by the Waterbury Farrell Foundry & Machine Co., Waterbury, Conn., and have a capacity of 30 rivets per minute for sizes ranging from ½-inch to 1⅜-inch diameter. A smaller machine has a capacity of 60 rivets per minute for sizes under ½ inch in diameter. The raw material for the rivet shop is first run through pickling and washing solutions and then conveyed to the draw bench, where it is drawn to the exact size before cold-heading. The raw material ranges in size from ¼ inch to 1⅜ inches in diameter and is reduced 1/32 inch by drawing. This department also contains bolt-heading machines and a

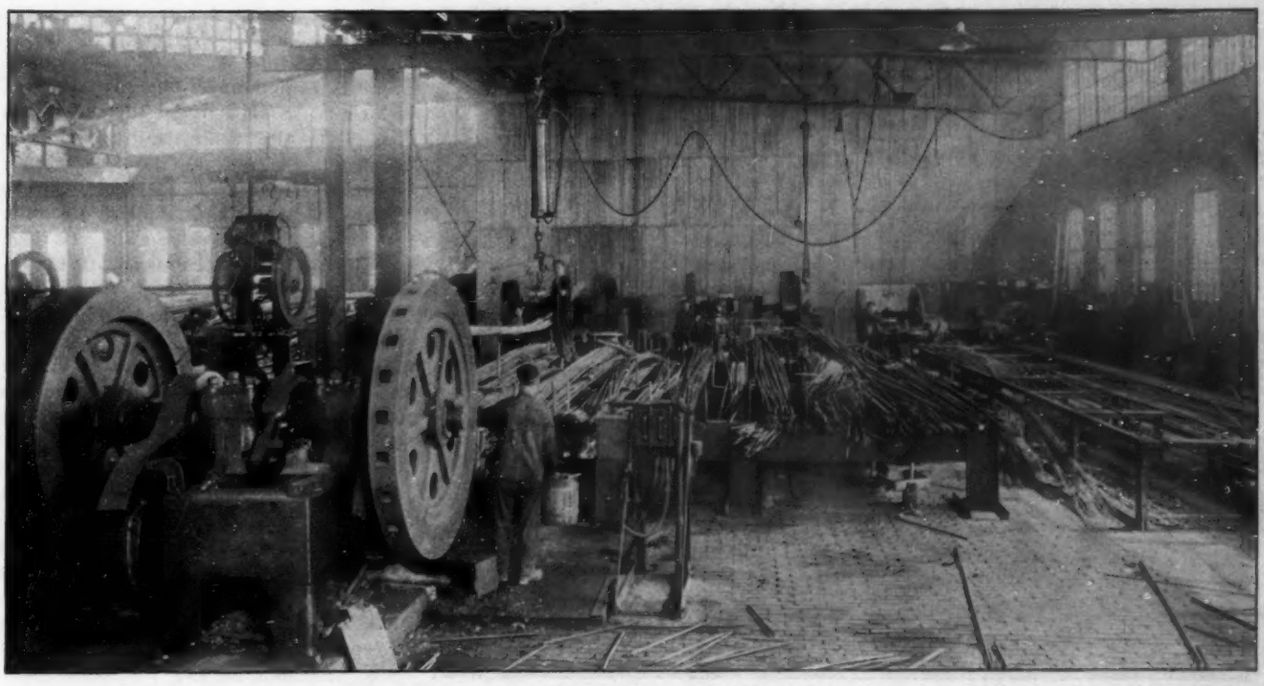


FIG. 6—RIVET MAKING MACHINES

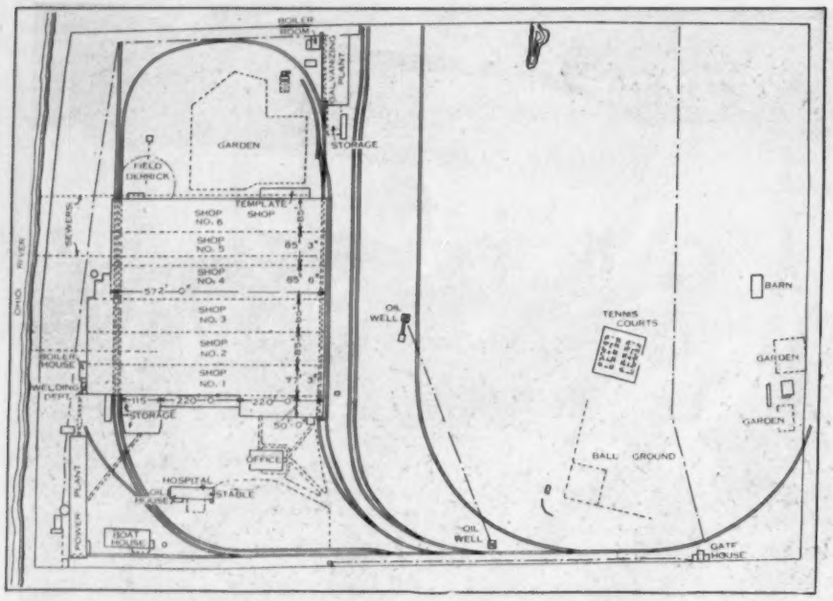


FIG. 7—GENERAL PLAN OF LEETSDALE WORKS

rotary gas-heated annealing furnace for rivets and bolts with a capacity of eight tons per day.

A great deal of fine plate work turned out by the company is cold-riveted, for which purpose powerful machines are required. The company has designed its own cold-riveting machines. The operator simply pulls a lever which releases a plunger that upsets the head of the rivet. The machine is so designed that when a predetermined pressure has been reached, a release valve is opened and the plunger moves back. Therefore, each rivet is driven with the same pressure and unequal strains are avoided.

The machine shop occupies the northeast ends of No. 2 and 3 shops and has some very efficient tools, embracing 15 lathes, five planers, six milling machines, one planer type milling machine, two hydraulic bending rolls, two vertical boring mills, four cylindrical grinders, three surface grinders, five radial drilling presses and a number of other smaller tools.

In shop No. 3, covering an area of about 85 x 638 feet, is located the forge shop, which contains a large amount of machine tool equipment, hydraulic presses, forging hammers, annealing ovens, etc. There are four steam hammers, two of 6,000 pounds capacity, two of 2,000 pounds capacity, an Ajax header, a Billings & Spencer drop hammer, and a large trimming press, built by the United Engineering & Foundry Co. The steam hammers, however, are operated by compressed air. A notable piece of equipment is a hydraulic press of 5,000 tons capacity, designed by the Riter-Conley Mfg. Co. and built by the Bethlehem Steel Co. The Riter-Conley company make a large number of steel cores, for concrete piles. The plates for these cores are formed under this big press. The gas-fired annealing furnace, Fig. 1, is of such size that it will take riveted pipe sections 30 feet long and 8 feet in diameter. There is also a 400-ton Chambersburg Engineering Co. press, a plate heating furnace, 15 x 20 feet in size and four heating furnaces for drop forge and general smith work.

FIG. 8—STRUCTURAL DEPARTMENT AT LEETSDALE PLANT

Caulked Gas Holders

No. 4 shop, 85½ x 616 feet, Fig. 10, is devoted exclusively to the building of gas holders, of which the Riter-Conley Mfg. Co. makes a specialty. The company entered this line of work in 1896 and since that time has built some of the largest gas holders in the

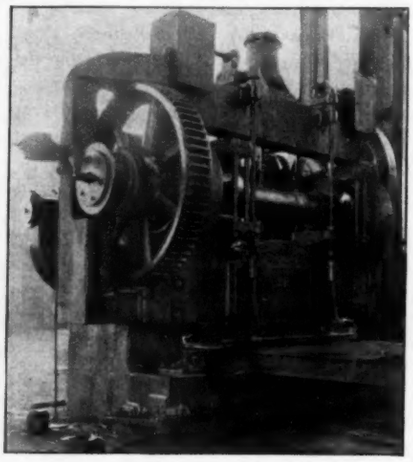


FIG. 9—MULTIPLE PUNCH AND SHEAR IN PLATE DEPARTMENT

country, including one at Detroit, which has a capacity of 6,000,000 cubic feet. At the time the Riter-Conley company entered the gas holder business, water gas was just coming into extensive use. It was found that the oil in this gas dissolved the red lead which had been used up to that time to make gas holder joints tight. As a consequence, many holders in various parts of the country were leaking. In order to provide a holder which would satisfactorily contain water gas, the Riter-Conley company decided to use a metal to metal caulked joint similar to that employed in steam boiler construction. The company also found it advisable to use a metal which does not corrode as easily as ordinary steel and as a result of considerable investigation has adopted an alloy which contains ½ per cent copper. The plates are box annealed at the Leetsdale plant before being fabricated in order to

eliminate the mill scale so that the paint will stick tenaciously.

The equipment in the gas holder department necessarily includes machines designed for heavy plate fabrication. This plate work has to be very exact, the material being worked down to 0.01 inch. There are installed eleven drill presses of various makes, a 40-foot plate edge planer, Fig. 10, of Riter-Conley design and two hydraulic presses, one of 600 tons capacity, and one of 1,000 tons capacity. There are also one horizontal and two vertical center punches, one multiple punch, one gate shear for shearing light holder shapes, and two rack punches with a capacity for handling plates 20 feet in width.

Shops Nos. 5 and 6, Fig. 8, are of comparatively recent construction, each being about 85 x 572 feet. They are devoted solely to structural work. Suitable equipment for heavy bridge and building fabrication has been installed. They contain a Long & Allstatter gang punch for punching col-

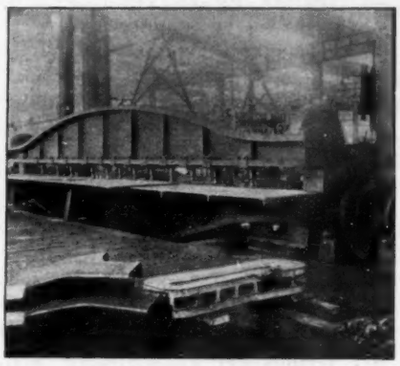


FIG. 10—FORTY-FOOT PLANER IN GAS HOLDER DEPARTMENT

umns and girder work, two punches for bars and angles, one set of straightening rolls for straightening columns and girder plates and two vertical center punches. There is a very large vertical center punch for punching plates, equipped with a ball bearing caster table, Fig. 12, so the plates can be handled to the best advantage. There is also a gang of four drill presses, nine column reamers, three electrically operated rivet gantries, two rotary compressors, one end shear, and a cold saw with a capacity for cutting 30-inch beams. Other equipment consists of an angle shear, a center punch for punching angles, one gang of four center punches especially designed for punching tower angles, three combination shear punches, one coping machine, a large rotary planer, bulldozer, and two stationary riveters. A large number of transmission towers are fabricated in the structural department. In order to handle this work expeditiously, a battery of four motor-driven punches,

FIG. 11—HORIZONTAL BENDING ROLLS IN PLATE DEPARTMENT

mounted on an adjustable rack, has been provided.

The borings and punchings are collected in steel boxes, which are handled by the traveling cranes. The boxes are 3 feet wide, 4 feet long and 3 feet deep. A scrap pit is located at the southeast corner of the plant, in which the borings and punchings are accumulated, and then from time to time as the larger boxes become filled, they are hoisted out by a locomotive crane and dumped into a gondola car.

The galvanizing plant, Fig. 5, is housed in a separate building, 71 x 176 feet, just north of the main building, as is clearly indicated on the general plan of the works. It is used largely for providing a protective coating for transmission towers. It is furnished with ample equipment, including suitable cranes, one pot, three pickling tanks, one wash tank and one drying table. Its capacity is 30 tons of material per day.

All the power throughout the plant is electric, No. 1 to 4 shops being run by alternating current and No. 5 and 6 by direct current. The power plant, Fig. 4, is contained in a fireproof building, 48 feet wide and 324 feet long. It includes some of the largest natural gas units now in service. For gener-

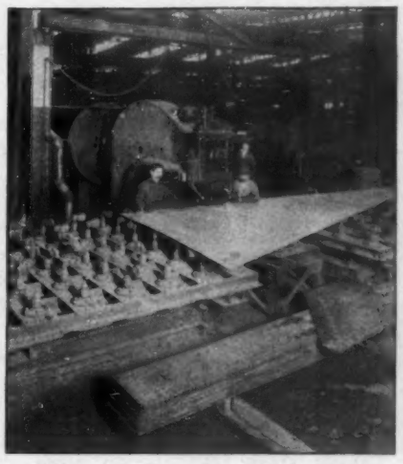


FIG. 12—CENTER PUNCH WITH CASTER TABLE

ating electric power, four 200-kilowatt, 3-phase Westinghouse vertical direct connected natural gas units and four 175-kilowatt direct current Westinghouse belted units are provided. A synchronous motor-generator set is installed to balance the loads between the direct current and alternating current equipment. The air compressing equipment consists of one Snow pump with a capacity for delivering 2,200 cubic feet of free air per minute, three gas engines belted to compressors, two with a capacity of 750 feet of free air per minute and one with a capacity of 800 feet of free air per minute. There is installed one electrically driven water pump and it together with a gas engine driven Wilson-Snyder pump, pumps the water from the Ohio river that is used throughout the entire plant.

The Riter-Conley Mfg. Co. in laying out this plant was not unmindful of the comforts and convenience of its employes. The company has made special effort to keep the grounds in

FIG. 13—MULTIPLE PUNCH IN STRUCTURAL DEPARTMENT

as attractive a condition as possible. The main office, which is a four-story brick and steel structure, is surrounded by flower beds and carefully kept lawns. Facing north, between the shops and the Fort Wayne railroad, there is a very large piece of ground, on which a baseball diamond is laid out, also two tennis courts, quoit grounds and putting greens. These facilities for recreation are placed at the disposal of any of the employes of the company. The vacant space north of No. 6 shop, which has been left to provide for future expansion, is now occupied by a garden, supplying vegetables which are used in the company's dining room. The company maintains a relief department, taking care of all injured employes without any charge, and the men who are off duty on account of injuries are paid half time. The company also maintains a hospital for taking prompt care of its men in case of accident. A notable feature of the plant is that all gas, air and water lines in each

of the six shops in the main building are laid in trenches, constructed of brick walls with a steel plate covering. They serve as a general walk throughout the plant, and no materials of any kind are allowed to be piled on them.

The plant of the Riter-Conley Mfg. Co. is said to be one of the best equipped and largest works in the world for fabricating miscellaneous plate and structural work. In addition to building gas works complete, the company builds and launches river boats, constructs electrical transmission towers, makes large plate girders for railroads or viaducts, and turns out coal storage plants and complete steel plants. Special emphasis is placed on turning out complete industrial plants from the design to placing the plant in operation. A list of the products includes everything that goes to make up steel construction.

Electric Drive for Existing Mills

BY L ROTHERA

THE question of the application of electrical driving to existing rolling mills is one which is of the greatest importance to a country such as England, where, to a very large extent, steel, iron and other metal works have been in existence for a considerable number of years, and where the question is, not the best method of putting up new works, but the best method of making an old works so economical that it can compete successfully with those in other countries, which have only within a later period entered this field, and have, consequently, been able to make use of the latest advancements of science.

The lowest figure for power in a steel works which has come to the author's knowledge is about 0.33 of a penny per unit, and the highest is in the neighborhood of one penny per unit. It is, of course, manifest that, with the lower cost there is little, if any, advantage in putting down a central station in the works themselves to be driven by steam, unless the necessary steam is available from waste heat boilers, as, even under modern conditions of steam turbine drive and large central capacity, say, of 1,000 kilowatts upwards, it is not possible to generate at a much lower figure than 0.3 of a penny per unit, this figure covering all charges, including interest and depreciation, wages, oil, stores, etc., and no mill manager will want to be troubled with his own station when he can purchase power at practically the same cost from an outside source.

Another factor is the class of work done. As is well known, the steam engine, while efficient on steady continuous load, becomes very inefficient on a widely fluctuating load. This is a condition which is not nearly so pronounced in the case of an electric motor drive, due to the fact that the efficiency over a very wide range, say from half-load up to 100 per cent overload, varies only to the extent of 2 or 3 per cent, while the steam consumption of an engine may vary as much as 7 to 9 per cent. When there is a considerable length of piping in conjunction with the engine the inefficiency in the latter case is more pronounced, as continual radiation losses are taking place from the pipe line whether the engine is working or standing still. The amount of steam consumed per useful horsepower will be very materially increased through this source of loss. It may thus be generally stated that the greater the fluctuations in the load, the more advantageous the electrical drive appears. As the load on a rolling mill is, in most cases, a variable one, varying possibly from practically no-load to nearly 100 per cent overload, the economy of the efficient electrical drive is apparent.

With regard to the question of improved drive, it is an undisputed fact that a steady uniform turning moment produces a better class of rolled material than is the case with a pulsating drive. Even under the best conditions of engine practice a considerable variation in the turning moment is bound to occur, and in this respect the electric motor with its uniform constant torque is far superior.

Assume that a works has four rolling mills, consisting of a forge train, two merchant mills and a sheet mill, the mills being driven by two engines, one driving the forge and one merchant mill, the other driving the sheet mill and the other merchant mill. Let us take an output of 30 tons of puddled bars from the forge train, 18 tons of flats, rounds, etc., per turn from the merchant mill attached to this engine, 8 tons per turn from the sheet mill, and 12 tons of rounds from this merchant mill. In order to obtain the above output, a total quantity of coal of approximately 1,980 tons per month would be used in the furnaces, and in addition approximately 270 tons of coal under hand-fired boilers. Taking steam evaporation from the furnaces at three times the weight of coal consumed, the steam raised from the furnaces would be 13,300,000 pounds per month, and from the steam under the boilers, assuming seven times evaporation, 4,240,000 pounds, that is, the total quantity of steam per hour would be 30,000 pounds. The whole of this steam is at present being employed in driving the above two engines, steam hammers and a few small auxiliary engines.

Suppose it was proposed to replace the engines by an electrical drive. Under the above conditions of output it can be taken that the total number of units to roll the tonnage mentioned would be approximately 400 kilowatts per hour. In order to deal with this, and also the auxiliary plant, which would perhaps take 70 kilowatts, a 500-kilowatt turbine would be installed. The steam pressure raised in boilers above puddling furnaces is usually very low, about 40 pounds per square inch, and under these conditions a steam consumption of approximately 20.1 pounds per kilowatt-hour would be necessary, that is, the total quantity of steam required would be 10,500 pounds per hour. The amount of steam produced from the waste heat boilers alone is 23,000 pounds, and taking the steam required for the hammers at 4,000 pounds per hour, there is left available no less than sufficient steam to raise a further 400 kilowatts, and at the same time give a saving in hand-firing of 270 tons of coal per month.

In the case of the main mill drives, the chief question in deciding the type of motor is, whether a variable speed is required or not. If a variable speed is required, as in the case of merchant mills, then a continuous current motor, which can have its speed varied by means of shunt regulation of the field, is the simplest and best proposition for the purpose. If a constant speed only is required, as in the case of a sheet mill, the disadvantages of the three-phase motor are not so great, although, even in such cases, it is very often a question as to whether the

(*Continued on page 894b*)

Presented at the spring meeting of the Institution of Mechanical Engineers of Great Britain.

Fig. 1—100-Ton Electric Tunnel Crane

Wrecking Crane for Tunnel Work

A DOUBLE end electric wrecking crane, designed to meet the underground clearances and unusual conditions existing in the Grand Central Terminal, New York, recently has been placed in service by the New York Central Lines. The crane also is adapted for use on the main line of the electric division and combines many of the functions of a crane with those of a high power electric locomotive, as it is equipped to travel to the scene of a wreck under its own power. It was designed and built by the Industrial Works, Bay City, Mich., from specifications prepared by the railroad engineers.

In the restricted space of the express level deck of the terminal, capacities must be attained under conditions where head room for raising the boom and room at the side for slewing are restricted. The crane built for the railroad company fulfills all the requirements desired.

The crane is of massive construction, the car body being 67 feet long, with a wheel base of 51 feet, and is carried on two compound trucks, made up of two four-wheel trucks each. A cradle on which the car body rests allows the trucks perfect freedom when taking curves. A comprehensive system of air-operated telescopic outriggers is used to add stability during heavy lifting and to distribute the load over a greater area. These are instantaneous in action.

At each end of the car is a 100-ton capacity crane. All operations may be performed independently, and, with loads up to the capacities of the motors, simultaneously. The air operation of all clutches insures quick and sure engagement and release.

The electrical equipment combines power and flexibility. Six motors, with a total capacity of 1,100 horsepower, are used for operating the crane; four, of 200 horsepower each, for propelling and two of 150 horsepower each, for hoisting and for operating the machinery. The propelling motors are direct connected to the axles of the compound trucks, two at each end of the car. All four may be used for traveling, or, if desired, only the two at either end.

For emergency service, required with the third rail out of commission, or when suitable cable connections cannot be made, there is installed on the crane a high capacity storage battery. This is ready for instant service to operate the crane independently. A complete testing and charging outfit permits the battery to be charged wherever connections can be made with a feed line.

The operation of hoisting is effected by means of a train of cut spur gearing. A brake of sufficient capacity is provided to hold the maximum load in any position, or to lower it at a low rate of speed. A combination clutch and brake is used for dispatch lowering of the block. In addition, there is a ratchet and pawl to hold the max-

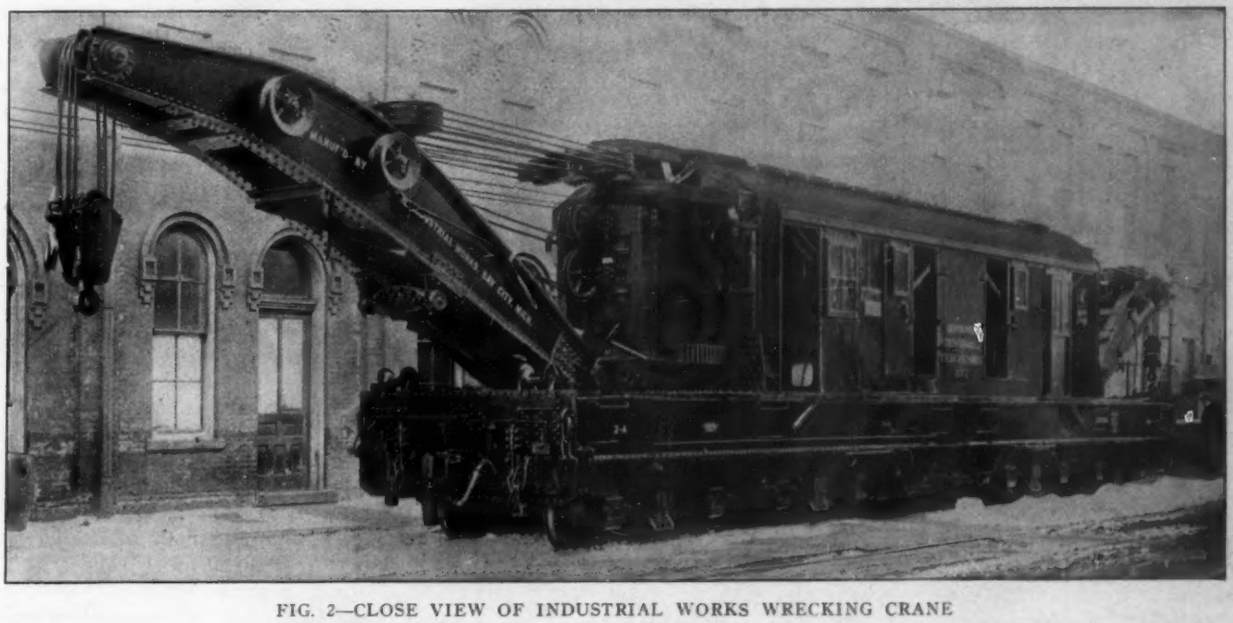


FIG. 2—CLOSE VIEW OF INDUSTRIAL WORKS WRECKING CRANE

imum load when the clutch is disengaged and the winch heads are in operation. These winch heads, which are on either side of the crane, are of 25 tons capacity and are independent in operation. The auxiliary hoist is arranged to operate at the same radius as the main block or at different points on the boom. The boom hoist or radius varying mechanism may be operated with the maximum load suspended from the boom.

With all four propelling motors in use the crane, hauling an 80-ton rolling load, was guaranteed to travel 25 miles per hour on straight level tracks, 15 miles per hour on a 2.7 per cent grade, and 12 miles per hour on straight level tracks with the addition of a 50-ton suspended load. Speeds greatly in excess of these have been attained. At the formal test conducted by the railroad officials, the crane propelled itself at a rate of 34 miles an hour while hauling an 80-ton rolling load.

Tests of Engine

Methods used in testing a 46 x 76 x 60-inch twin tandem compound reversing engine driving a 44-inch reversing blooming mill when rolling 20 x 20-inch ingots, were discussed April 21 by Karl Nibecker, steam engineer, the Youngstown Sheet & Tube Co., Youngstown, O., before the Engineers' Society of Western Pennsylvania. The engine was built by the Mesta Machine Co., Pittsburgh. It was briefly described in the August 14, 1913, issue of THE IRON TRADE REVIEW, and the results of the initial test were given in the February 19, 1914, issue of THE IRON TRADE REVIEW. Mr. Nibecker confined his remarks to tests made after the engine was in operation several months, and brought out a number of interesting features not mentioned in previous discussions.

Lantern slide charts offered by Mr. Nibecker showed that 34.5 per cent of the total available work of the engine is consumed in accelerating and retarding the rotating and reciprocating parts; 9.8 per cent is used in friction and only 55.7 per cent is used in deforming the ingots. The low amount of power consumed in friction is partly obtained by the use of large bearings, properly lubricated. The pinions are also of the latest type of construction, and the couplings are of special design, which eliminates, the speaker said, all lost motion and reduces the friction and wear to a minimum.

It was stated that the steam consumed per indicated horsepower hour was found to have a maximum value of 23.6 pounds after adding 35 per cent for condensation, leakage, etc. The figure of 35 per cent was arbitrarily fixed by the various engineers through lack of a definite figure and was purposely placed high in order to be on the safe side, it developed in the discussion of the paper. Since the test was run, however, the steam consumption has been checked by means of a steam meter. This shows that 35 per cent is too high; 10 per cent, builders of the engine say, would be nearer the correct figure. By adding 10 per cent for condensation, leakage, etc., the steam consumption per indicated horsepower hour would be reduced to 18 pounds, considered remarkable for a reversing engine. To the best of Mr. Nibecker's knowledge, the best steam consumption yet obtained in this country for reversing condensing engines is about 35 pounds.

The average value of steam consumed per indicated horsepower hour was about 21 pounds, which is almost identical with the steam consumption of a high class three high mill.

The engine described will change from a speed of 60 revolutions per minute in one direction to 30 revolutions per minute in the opposite direction in less than 2½ seconds, Mr. Nibecker said in his concluding remarks. The engine has rolled 500 ingots in 12 hours with an average elongation of eight, indicating that it is possible to manipulate the engine and mill very quickly. The weight of the 500 ingots was 1,289 tons, and not one of them was rolled in less than 15 passes. The average time for rolling a 2½-ton ingot, according to the test described, was 85 seconds from the time it reached the rolls until it left them. The time of manipulation and of actual rolling was found to be about equal.

Observations made by Mr. Nibecker indicated that it requires approximately 3/5 of a second to move the control lever through its entire travel. One and one-half seconds are required from the beginning of the movement of the reversing lever until the links are fully reversed.

One of the figures thrown upon the screen showed the relative operation of the reversing cylinder and throttle valve. At the beginning of pass two and three is seen the action of the gear when operating slowly, the piece entering the rolls three strokes after the jack is moved from its center position. At the beginning of pass five the piece enters the rolls at the same time the reversing gear is moved off center.

The condenser maintains a remarkably uniform vacuum during the rolling of the ingots, it was stated. The temperature of the tail water varies from 10 to 15 degrees during the rolling process, but drops back to its original value almost immediately.

Steel Mill Gas Engines

F. C. Gasche, of the Illinois Steel Co., read a paper, April 27, before a joint meeting of the Chicago section of the American Institute of Electrical Engineers and the electrical section of the Western Society of Engineers. His subject was "Power Problems in Steel Mills". He devoted his paper to a discussion of the blast furnace gas engine as a prime mover in steel mill practice as compared with the turbo-generator for developing electric power.

Mr. Gasche finds from his experience that the gas engine is not as applicable to steel mill practice as the turbo-generator, as its possible overload does not exceed 25 per cent while the peak load often presenting itself in steel mill practice is so high it causes an appreciable lag which no form of governing device and no flywheel has been able to overcome.

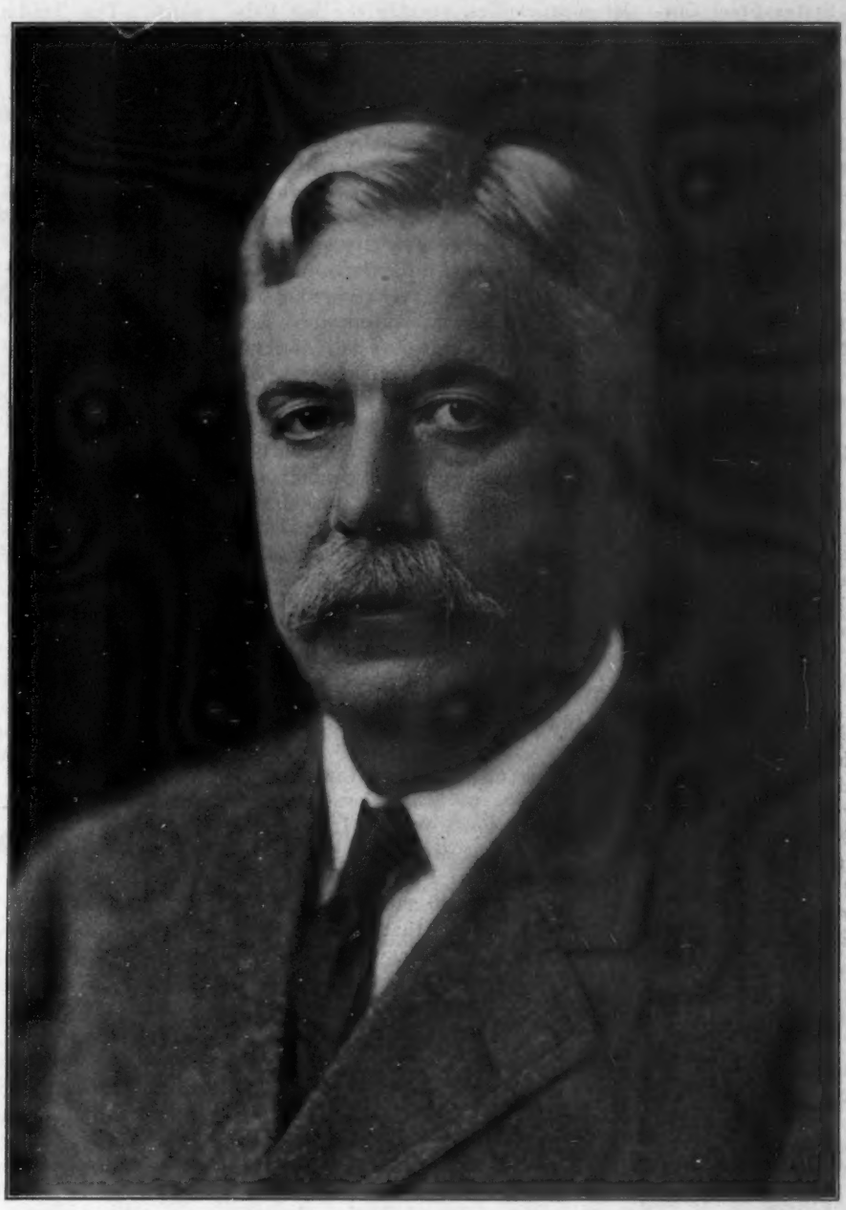
While he has no antagonism to the gas engine as a producer of power under steady load, it is his experience that steel mill practice furnishes so high a peak load without warning that some other form of prime mover is necessary at least as an adjunct to meet the unusual demands of this form of operation.

In answer to a question and without referring to exact data to guide him, he assumed that if 70 per cent of the estimated power for a given plant should be in gas engines and the remaining 30 per cent in turbo-generators, the plant would give much better service than if the entire power should be furnished by gas engines alone.

The Mellon Institute of Industrial Research, Pittsburgh, is conducting a series of industrial fellowships along plans originally laid down by the late Robert Kennedy Duncan. By the terms of these fellowships certain industrial companies donate sums to the institute for original research. Fellows are appointed to conduct the work and the results of their efforts are placed at the disposal of the interested companies. At the present time a large number of valuable investigations are under way, including an inquiry into methods of coating steel and other metals with copper, turbine engines and the effect of high potential electricity on chemical reactions.

Death of Alex. B. Scully

From a messenger boy for the Western Union Telegraph Co. to the head of the Scully Steel & Iron Co., is the life history of Alexander B. Scully, who died Thursday, May 7, at his home in Chicago. The various steps leading from his first employment to the position he had held many years prior to his death brought him in contact with almost every steel warehousing concern in Chicago, most of which he touched as an executive official. "Scully Service" has been burned into the mind of the public by continued advertising not only in technical and trade journals, but also in the daily newspapers to a point where everyone who reads advertising at all is familiar with the phrase. Mr. Scully was a firm believer in advertising of a general character and his methods were such as to impress upon everyone the fact that his company was ready to serve with speed, quality and assortment.



A. B. SCULLY

Alexander B. Scully was born in Chicago, Nov. 29, 1856, and obtained his education in the public schools of that city. His first employment after he left school was as a messenger boy for the Western Union Telegraph Co. This work did not offer him the advancement he believed necessary, and in 1875 he entered the employ of Joseph T. Ryerson as a messenger. There he found his vocation. For 10 years he served Mr. Ryerson's interests and after leaving that employment, in which he had studied the business thoroughly and grounded himself in its intricacies, he formed the W. F. Mallory Co., which was an iron and steel warehousing concern, and in 1890 this was sold to Joseph T. Ryerson & Son. The next year, in 1891, he formed the Scully-Castle Co., which later became the Scully Steel & Iron Co., of which he was president until his death. Thus it will be seen he was associated as an employe or founder with practically every steel warehousing concern in Chicago and was practically founder of all but two.

Not all his time and interest was devoted to the steel business, however, as Mr. Scully was interested in the human side of things as well, being a member of the Chicago Athletic Association, Chicago Golf Club, Chicago Yacht Club, Union League, Exmoor and South Shore Country Club.

His acquaintance, gained through many years of business contact with men in all walks of life, was broad and included men at the head of great concerns as well as the workers in more humble stations.

He is survived by his wife and two sons, Alexander Clifford Scully and James Stewart Scully.

Wilson B. Chisholm, aged 65 years, president of the Champion Rivet Co., for 15 years vice president and manager of the Cleveland Rolling Mill Co., and identified with other iron and steel interests, died Sunday, May 10, at his home, in East Cleveland. Death resulted after a lingering illness following a stroke of apoplexy suffered several years ago. Mr. Chisholm was born in Montreal, and went to Cleveland in 1850 with his father, who founded the firm which later became the Cleveland Rolling Mill Co., which later was absorbed by the American Steel & Wire Co. Mr. Chisholm was interested in the Chisholm - Phillips Automobili u m Co., of which his son Henry is president, and the Chisholm & Moore Mfg. Co., of which his brother, S. H. Chisholm, is president. His son Henry was also treasurer and secretary of the Champion Rivet Co.

Three sons-in-law, E. S. Burke Jr., John H. Hord and Frank C. Newcomer, are prominently identified with Cleveland commercial life.

He was well known as a horseman and owned several famous racers.

Light Shipment from Old Ranges

Will be Made by the Steel Corporation Unless Business Conditions Show Decided Change for the Better

Ore dock agents at Marquette have been advised from Cleveland that shipments from that Lake Superior port by the United States Steel Corporation have been discontinued indefinitely. The reason is that unless business conditions improve decidedly, there will be no demand for heavy shipments from the old range mines. Corporation officials are not willing to hazard a guess as to what these shipments will be.

The Steel Corporation's shipments from the Marquette range have been very light to date this spring. Only one steamship of the company has loaded at Marquette. It is explained on the Gogebic range that the recent curtailment of the Steel Corporation operations in that region was made necessary because practically all the available stockpile room had been filled and ore was being hoisted at a rate greater than shipments could be made direct from the shafts. The Gogebic mines are operated more briskly than are others on the older ranges for the reason that they are wrought on a royalty basis, whereas various properties elsewhere are owned in fee by the corporation and are held in reserve, either being closed entirely or producing much below capacity. Of the 750 men laid off in the Gogebic country, 300 were employed at the Pabst, 250 at the Norrie, 150 at the Aurora, and 50 at the Puritan. The aggregate force had for months been the largest in the history of the mines, and there are still at work nearly 2,000 men. No retrenchment was made at the Tilden, Geneva and Davis properties, at all of which the operations are largely of an exploratory nature. Night-shift work has been discontinued at the East Norrie, Pabst, Aurora and Puritan and also at one shaft of the Norrie. It is expected that all the ore in stock will be sent out this season.

Menominee Range

Shipments from the Menominee range are slow. Operations have been suspended at the Rogers-Brown Ore Co.'s Chicagon mine, midway between Iron River and Crystal Falls, and there is apprehension the curtailment will extend to other properties. In the Crystal Falls district, it is reported, work is more scarce than at any time in a decade or more. Whereas a year ago common labor was difficult to procure at $2.25 to $2.50 a day, plenty is available now at $1.75. Several of the mines have particularly large stockpiles, notably the big Bristol of Oglebay, Norton & Co. Most of the Corrigan-McKinney Co.'s group are idle. The Dunn and the Armenia are in commission, but are operating on a small scale. Conditions in the Crystal Falls field are not altogether depressed, however. The Cuyahoga Iron Co. is giving work to 75 men at the Hilltop mine, which it has leased and is restoring to activity. M. A. Hanna & Co. are developing the Carpenter and Ravenna properties, both of which are expected to be continued in operation throughout the year. The Ravenna will ship this season for the first time. Incidental to its mining operations, there has been recently a subsidence of part of the ground overlying the ore body. Some trouble has been occasioned, as well as apprehension on the part of the railroad people lest their expensive sidings be made valueless.

Old Mine Resumes

After an idleness of 28 years, the old Indiana mine is to be restored to activity. The property will be developed and operated by the Thomas Furnace Co., of Milwaukee. It is in Section 27, 40-30, in the Iron Mountain zone of the Menominee range and adjacent to Lake Fumee. The Indiana was opened in 1880 and closed in 1886, producing during that period 18,000 tons of ore. It was a wet proposition and with the pumping machinery of the time was difficult to keep drained. Besides, the operators were men of limited financial means. Capt. John T. Spencer, of Iron Mountain, a persistent seeker for ore, has been exploring in the vicinity for the last several years under a lease procured from the Keweenaw association, of Boston, the owner of the fee, the tract concerned comprising 80 acres and including the Indiana. Capt. Spencer has been successful in finding ore not before encountered and he has now sub-leased the property to the Thomas company. Machinery is already being delivered and development will soon be in progress.

Under a contract recently awarded by the Republic Iron & Steel Co., acting for the Antoine Ore Co., which it controls in part, stripping is in progress at the Traders mine at Iron Mountain. The Hoose & Person Construction Co., of that city, is doing the work. The Traders is a milling pit, operated only during the summer season. It will ship 100,000 tons this year, preparations for which are now under way. About 150 men will be employed.

May Drop It

The officials of the Grange are still wrestling with a problem of vital importance to the iron and copper interests—whether the influence of the big organization of farmers shall be thrown behind the tonnage tax project. N. P. Hull, past master, and C. T. Bramble, member of the executive committee, who have been looking up data, find that the tonnage tax proposition is a perplexing one, and one that will be hard to solve by legislation. There are so many angles to it, so many legal technicalities to be avoided and so much difficulty involved in framing a law that will do equal justice to all concerned that it appears not unlikely the scheme will be dropped for the present at least. One of the most difficult phases of the problem is the variation in quality of ore in the mines and the difference in cost of production.

Cuyuna Operations

Brainerd, Minn., May 11.—The first mine on the south range to ship was the Barrows mine of the Virginia Ore Mining Co., a subsidiary of the M. A. Hanna Co. A steam shovel of the Northern Pacific railway is now working at the 40,000 ton stockpile accumulated in the winter. The Cuyuna-Duluth mine at Ironton and the Cuyuna-Mille Lacs mine at Iron Mountain, also in Northern Pacific territory, will soon commence shipping. The Adams mine at Oreland, on the south range, has a 2,500 ton stockpile.

Ore assaying 52 per cent has been found in the second hole drilled by the Longyear Exploration Co., at the Crow Wing county poor farm property. There was encountered 240 feet of surface.

The Kennedy mine at Cuyuna and the Armour No. 2 mine at Crosby and Ironton, both belonging to the Rogers, Brown Ore Co., are hoisting from shaft to cars and shipping. No ore has been removed from stockpile.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

In New York, the most important event in the machinery market is the awarding of a large contract by the Chinese government to the Pratt & Whitney Co., Hartford. This contract calls for gun-making machinery and other equipment for a complete arsenal, and is said to involve an outlay of about $1,250,000. The only other important development of the week was the issuance of a large list of machine tools, on which, however, competitive bids have not been asked. In general, the market continues dull. Users of machinery still manifest a preference for second-hand machinery instead of new; of late, there has been an improvement in the volume of inquiries for second-hand machinery. The General Electric Co. has put out a large list of used machinery, which it has for sale and on this bids are being asked. There is an improvement in the demand for cranes.

In Chicago, no decided change is apparent in the machine tool market, demand being about the same as has existed since the first of the year, mostly for single tools or small equipments. One concern, however, states April proved the best month in two years with a single exception. Almost entire absence of buying by automobile manufacturing plants is responsible for some of the dullness, but this is being replaced to some degree by scattered buying in other industries, which apparently are becoming somewhat livelier.

In Pittsburgh, conditions in the machine tool market are unchanged this week. Inquiries are light and purchasers are not closing transactions until actually in need of equipment. Building of new plants in this district has given some life to what otherwise would be a decidedly dull situation. Builders of heavy rolling mill equipment continue to operate plants at practically full capacity.

In Cincinnati, judging from the reports of manufacturers, the machine tool market is on the decline. This applies principally to those companies which enjoyed fairly good business in March and April, the former month being the better of the two. Some plants claim that they have not closed any orders to speak of for over six months. Business is mostly for single tools or for second-hand equipment, which indicates that railroads and automobile manufacturers are not buying. The foundry business is very slow and very few plants are running more than 50 per cent of their respective capacities. Small electrical equipment is in only fair demand. A review of business done in April shows that lathes, milling machines, metal-bending and woodwork machinery were the best in demand.

EASTERN STATES

ATHOL, MASS.—The Union Twist Drill Co. is taking immediate steps to erect a large three-story addition to its cutter department. President McGregor reports business as excellent. This company is also having plans drawn for an addition to its factory at Derby Line, Vt., which will cost about $50,000. It will be of brick, fireproof construction, three stories, 180 feet by 60.

FITCHBURG, MASS. — Details regarding the building operations of Manning, Maxwell & Moore, who have bought the Putnam Machine Co., are as follows: There will be six new buildings. The main shop will be 220 x 300 feet, two stories. The foundry will be a brick building, 120 x 200 feet, and the blacksmith shop will be a brick building, 50 x 100 feet. The pattern shop will be four stories high, of brick, 50 x 100 feet. The office building will be a modern structure three stories, 50 x 100 feet. The power plant will be of brick, 48 x 84 feet, two stories. The buildings will all be fireproof. The contracts for building these structures have been awarded and work will be pushed as fast as possible.

ANSONIA, CONN.—The Farrell Foundry & Machine Co. is preparing plans for the erection of a new plant.

ANSONIA, CONN. — The Ansonia Brass & Copper Co. will erect a 2-story, 60 x 440-foot brick and steel building to be used for storage and shipping purposes.

BRANFORD, CONN. — The Malleable Iron Fittings Co. has started to erect a 4-story and basement, 68 x 265-foot brick, steel and concrete addition to its plant.

BRIDGEPORT, CONN. — The American Chain Co. is about to erect a 3-story, 30 x 200-foot building of steel and reinforced concrete.

BRIDGEPORT, CONN. — The Prentice Mfg. Co. has let the contract for a 3-story, 40 x 80-foot factory to be erected in the Kensington district; a 1-story, 15 x 40-foot power house is also proposed.

BRIDGEPORT, CONN.—The Bassick Machinery Co. has been incorporated to be capitalized at $50,000 and starts business with $10,000; incorporators are Edgar W. Bassick, John N. Thornton and Noeman W. Cummins, all of Bridgeport.

ENFIELD, CONN. — The Connecticut Light & Power Co. has leased a site on which it will erect two large gas storage tanks.

HARTFORD, CONN.—The J. H. Crozier Co. will erect a $14,000 brick factory building at 28 Laurel street for the Merrow Machine Co.

NEW BRITAIN, CONN.—The New Britain Machine Co. has increased its capital stock to $800,000.

NEW BRITAIN, CONN.—Landers Frary & Clark plan to start soon on a 6-story, 60 x 140-foot factory building on land just purchased.

NEW BRITAIN, CONN. — The Stanley Works of this city plans for a 6-story brick storage and factory building to be erected in Chicago. Ultimately the company will place a plant in Canada and make improvements to the local plant.

NEW HAVEN, CONN.—The Winchester Repeating Arms Co. has bought a 300 x 1,200-foot tract on Forbes avenue and will develop a water terminal with storage facilities.

NEW HAVEN, CONN.—The White Adding Machine Co. has increased its capital stock to $1,000,000.

SEYMOUR, CONN.—H. P. & E. Day, Inc., maker of the Waterman fountain pen, has awarded the contract for a 5-story, 30 x 100-foot reinforced concrete factory building. Vulcanizing departments and an engine room will also be erected.

GENEVA, N. Y.—Geneva Cutlery Co. has let the contract for its proposed $5,000 factory to the Jardine Bros.

LONG ISLAND CITY, N. Y.—The American Bar Lock Co. has bought six lots in this place. These have a frontage of 75 feet each on the north side of Borden avenue and south side of Third street, extending 180 feet through the block. The company is to build a large brick factory for the manufacture of skylight bar fastenings and door fastenings.

BELLWOOD, PA. — The city Business Men's Association has purchased a site for the Bellwood Steel Works at $2,360; construction will start at once.

CAMBRIDGE, PA. — The Erie Construction Co. asks a charter to build a traction line from Erie to Corry; Felix Curtz, Albert H. Jarecki, George Metcalk and Charles M. Hatch are charter members of the firm.

CHARLEROI, PA.—The Pittsburgh Railways Co. has purchased two lots as a site for a modern passenger and freight station. Work will begin at once and a "Y" will be built.

ERIE, PA. — The Keystone Construction Co., just organized, will ask a charter of the state of Pennsylvania at Harrisburg, May 25.

The company asks for the right to manufacture equipment and construct railways, terminals, bridges and buildings. The incorporators are George Bulock, M. D. Evans and J. M. Sherwin. Mr. Sherwin is solicitor in Erie for the Buffalo & Lake Erie Traction Co. and the Erie & Suburban Railway Co., controlling the cars running between the city and the Erie Works of the General Electric Co.

ERIE, PA.—The Griffin Mfg. Co. will erect an $8,000 boiler house at its factory. The shop will be two stories high of brick, steel and concrete with a 165-foot stack.

JOHNSTOWN, PA.—The Grazier Coal & Coke Co. has been incorporated; $10,000; by J. A. Grazier, H. F. Grazier and J. B. Grazier, Johnstown.

PHILADELPHIA.—The Hellwig Silk Dyeing Co. plans to erect a 1-story, 100 x 158-foot mill building to be used as a dyeing house; a 2-story, 32.5 x 138-foot office and finishing building and a boiler room, 62 x 120 feet.

PITTSBURGH. — The Allegheny Forging Co., capital, $5,000, has been incorporated at Harrisburg, by G. H. G. Gray, Crafton; E. M. Refior, Pittsburgh and P. Westlake, Tarentum.

JERSEY CITY, N. J.—Lorentz Iron & Machine Works has been incorporated to deal in iron and machinery; $100,000; by Frederick W. Lorentz, George W. Greene, John Lorentz, Jersey City.

NEWARK, N. J.—The Packard Motor Car Co. is getting ready to erect a three-story, 60 x 141-foot automobile service station and show room at Broad and East Kinney streets.

NEWARK, N. J.—The Aluminum Goods Mfg. Co. has announced that work will be started within a month on a new four-story and basement concrete and steel factory, to cost $125,000. It will occupy the block bounded by Belmont and Ridgewood avenues, and Peddie and Runyon streets, which is 270 x 570 feet. The plans allow for the building of four additional stories later. The Aluminum Goods company now employs 160 people in Newark, and, according to Remus Koenig, the local manager, this force will be doubled on the completion of the new plant.

UNION, N. J. — Utilities Mfg. Co. has been incorporated; $100,000; by William A. Brady, Charles S. Brady, Union; G. L. Reenstrierna, Congers, N. Y.

WASHINGTON.—T. J. Cowie will receive bids at the navy department until May 26 to furnish a 40-ton bridge crane with 5-ton auxiliary hoist; also 5-ton wall crane, schedule 6687; to be delivered at Puget Sound, Wash.

WASHINGTON.—H. R. Stanford will receive bids until May 23 at the navy department to construct steel tower and concrete foundation at the wireless station, Beaufort, N. C.

WASHINGTON.—T. J. Cowie will receive bids at the navy department until May 26 to furnish disc grinder and roll sander, schedule 6705, delivery at the Naval Academy, Annapolis, Md.; also for a motor-driven radial wall drill, punching machines, single end shearing machine, three sets of bending rolls and gate or squaring motor driven shears, schedule 6711; also motor-driven bulldozer bending machine, schedule 6710; delivery at Charleston, S. C.

WASHINGTON.—T. J. Cowie, paymaster-general, will take bids until May 26, as follows: For 4,000 feet of plain armoring and leading single conductor; 150,000 feet of C. M. cable, schedule 6737; 2,600 feet of leaded or armored soft steel interior communication cable, 4-cond., schedule 6740, for delivery at Brooklyn, N. Y.; 800 feet of electric cable, 500,000 C. M., schedule 6731, for delivery at Washington; also for a motor-driven variable speed upright 24-inch drill, schedule 6735, for delivery at Brooklyn, N. Y.; for two vertical self-contained 5-horsepower steam engines, schedule 6767, for delivery at Norfolk, Va.; for two motor-driven, direct connected centrifugal fuel oil pumping units, schedule 6764, for delivery at Boston; also complete fire pump, schedule 6765, for delivery at Key West, Fla.; for miscellaneous lot of Pennsylvania standard steel rail and standard splice bars, 85 pounds, schedule 6732, for delivery at Washington.

CENTRAL STATES

AKRON, O.—The John Knapp Sons' Foundry Co. has been incorporated; machine shop; $50,000; by John Knapp Jr., Anthony Knapp, Chas. Knapp, Frank Knapp and Margaret Knapp.

CANAL DOVER, O.—The Braunhoff Electric Co. has been organized here to manufacture electric motors; capital stock, $50,000; W. A. Braun, Jesse D. Baker et al. are interested.

CINCINNATI.—The Andrew Nessner Co., brass founder, is in the market for a little equipment needed in remodeling its plant.

CINCINNATI.—The R. K. LeBlond Machine Tool Co. will build a 2-story, 20 x 90-foot addition to its cutting department; plans by Zettle & Rapp, Cincinnati architects.

CINCINNATI.—Bids for the construction of the new plant of the French Bros.-Bauer Co., Cincinnati, which will be erected at Canal and Plum streets, that city, will not be taken for about six weeks. The building will be of concrete construction and the steel required will consist of reinforcing bars, beams and girders.

CLEVELAND.—Bids will be received at 513 the City Hall until noon May 20 for the following: For foundations, steel work, floors and general building in the high pressure pumping station, East Eleventh street, for the municipal electric light plant; for one motor-driven 4-inch centrifugal pump and one steam turbine driven 10-inch centrifugal pump for the city hospital. Proposal blanks must be obtained from room 209 the City Hall. Bids will be received at the same time and place for electrical wiring and equipment for the Fairmont pumping station of the city water department.

COLUMBUS, O.—John E. Bleekman, vice president of the Union Depot & Terminal Co. has completed tentative plans for the $800,000 depot to be erected at Third and Walnut streets.

COLUMBUS.—A small amount of pumping equipment will be purchased in the near future by the city of Columbus, following a recent appropriation of $125,000 to increase the capacity of its water works plant.

COLUMBUS, O.—The Chardon Jefferson & Meadville Interurban railway has asked consent of the public utilities commission to issue $300,000 capital stock and $425,000 25-year 5 per cent first mortgage bonds.

COLUMBUS, O. — The officials of the Hocking Valley railroad are planning to construct a double track between Toledo and Columbus. This step is being taken in anticipation of increased traffic from the Chesapeake and Ohio connection at Portsmouth; estimated cost, $8,000,000.

LORAIN, O.—The Safety & Savings Gas Appliance Co. has been incorporated to manufacture a patent valve; $50,000; by W. E. Knight, J. H. Brandon et al.

MARYSVILLE, O. — C. A. Morelock, county auditor, will open bids June 1 for the superstructure and substructure for the Carter bridge in Washington township, 100-foot span, 16-foot roadway; also for the Dover bridge, 175-foot span, 15-foot roadway; plans now on file. A certified check for 10 per cent is required.

SANDUSKY, O. — Gallagher Bros. will build a 2-story, 33 x 115-foot, stone, brick and concrete storage and warehouse in Railroad street in the rear of its present building.

SPRINGFIELD, O.—City Engineer M. J. Bahin has estimated the cost of the proposed Betchel avenue iron bridge at $19,822.

SPRINGFIELD, O.—The W. W. Lindsay Co., Philadelphia, has the contract for the proposed car barns and shops of the Springfield railway. The building will cost about $100,000.

TOLEDO, O. — The Urschel Valve Bag Co. plans to erect a 2-story, 90 x 112-foot concrete and steel factory building at Summit and Michigan avenues; cost exclusive of plumbing, heating and lighting is estimated at $47,500; building to be ready for occupancy by August.

URBANA, O.—The Acme Die & Stamping Co. has been incorporated to manufacture dies and tools; $10,000; by Charles H. Keener, Lincoln Burnham, R. C. Burnham, Ralph B. Duffey, Clinton M. Diver.

XENIA, O. — Geo. W. Kendall, county clerk, will open bids May 21 for a low truss steel bridge across Middle run on the Bellewood and Waynesville pike.

KANAWHA, W. VA. — Kanawha City Bridge Co. of Charleston, W. Va., has been incorporated here to build a bridge across the Kanawha river; capital stock, $250,000; incorporators, W. A. MacCorkle, F. M. Staunton, M. M. Williamson, Harrison B. Smith and John L. Dickinson, of Charleston.

COVINGTON, KY. — The Star Foundry Co. is adding a molding room to its plant. A small amount of equipment will be needed.

LOUISVILLE, KY. — Universal Swing Joint Co. has been incorporated; $100,000; by John Bridges, John H. Hile, M. E. Lansing, Ben L. Bruner, Minnie Lee McDaniels, W. P. Decker, R. L. Lowery, M. L. Buckner et al.

MAYSVILLE, KY.—Plans are ready for the proposed $40,000 Odd Fellows Temple to be of concrete, steel and brick; construction will start next month.

HUNTINGTON, IND.—The Majestic Furnace & Foundry Co. has increased its capital stock from $30,000 to $60,000.

CHICAGO.—W. D. Mann, 155 North Clark street, is taking bids on an apartment building for Dr. Cameron, three stories, 63 x 125 feet, brick, terra cotta and steel.

CHICAGO.—Robert J. Gunning, 39 West Van Buren street, is having plans made for a mercantile building, seven stories, 646 South Clark street, structural steel.

CHICAGO. — Erickson Machinery Co. has been incorporated; $5,000; by Emil Erickson, Chas. Alburn and Chas. A. Gelin, 2467 East Seventy-fourth street.

CHICAGO. — The Illinois State Public Utilities Commission has ordered the Chicago and Oak Park Elevated railroad to file plans for elevating its road from Laramie avenue to the western terminal of the road before July 1. The elevation is to be started within 60 days after plans are approved.

CHICAGO. — The Premier Mfg. Co. has been incorporated to manufacture and deal in metal products, special machinery and tools; $25,000; by Samuel Stroble, Evelyn Rabinoff and Samuel E. Rabinoff, 79 W. Monroe street.

DANVILLE, ILL.—J. W. Fairchild, 211 King block, has the general contract for a warehouse, three stories, 150 x 240 feet, to cost $62,000, of brick and reinforced concrete.

MACOMB, ILL.—Henry H. Fuhr has the general contract for a hotel building, 50 x 105 feet, of brick and steel.

ANN ARBOR, MICH.—George Scott, Post Office box 104, is taking bids for a mercantile building, four stories, 44 x 124 feet, of concrete, brick with iron columns and structural steel girders.

HOUGHTON, MICH.—Fire May 6 damaged the plant of the Carrell Brothers Foundry Co. The principal loss was in patterns owned by various upper Michigan concerns. Among the machinery damaged was a lathe designed and built by John Ericsson in 1861 to turn the turret of the Monitor. This was to have been bought by Swedish Americans to exhibit at the Panama Pacific Exposition, and then was to go to the Smithsonian Institution.

GRAND RAPIDS, MICH.—The Fabricating Steel Co., capitalized at $150,000, will erect a 60 x 300-foot plant; Frank J. Pickett, cashier of Madison Square Branch of the Grand Rapids Savings Bank, is the main promotor.

LANSING, MICH. — Bohland Structural Steel Co. has been incorporated; $10,000; John W. Bohland is president.

OWOSSO, MICH.—W. E. Wood & Co., of Detroit, has the contract for the 75 x 168-foot addition to the foundry of the American Malleable Co. building, to be completed by June 15.

APPLETON, WIS. — The Killen-Strait Tractor Co., just reorganized with $200,000 capital, is contemplating additions to care for blacksmithing, tin work and general assembling. New equipment is being purchased, the orders already placed calling for a Kempsmith milling machine, an American radial drill, a 24-inch Stratford lathe, a Fosdick radial drill and a 3-spindle Hoffer drill. W. K. Strait is general superintendent.

BELOIT, WIS.—E. M. Kenyon, manager of the Dodge Mfg. Co. has purchased the property of the J. Thompson Sons Co. in South Beloit and will build an addition at once. He will manufacture farm engines.

CLINTONVILLE, WIS.—The South Side Machine & Auto Co. has been incorporated; $15,000; by William Splittberger, Frank Ebert, Arthur Peotter; Levi C. Larson, Clintonville, attorney.

EAU CLAIRE, WIS.—Following out its policy of extending its works to four times their present capacity, the A. E. White Machine Works has purchased the plant of the former Reinhard Ball Bearing Pad Co. and is using it for casting dies. Plans are being made for some new construction during the year.

GRAND RAPIDS, WIS.—The Kaye Mfg. Co., interior hardwood finish, is building a 2-story addition, 36 x 70 feet, and is buying woodworking machinery. The present power plant is sufficient for the additional demand.

JACOBS, WIS.—Two steel bridges are to be erected here; a $1,600 one over the east fork of Chippewa river and a $600 one over Mud Creek.

LA CROSSE, WIS.—La Crosse Steel & Construction Co. has been incorporated; $12,000; by Geo. W. Trayer, Fred A. Phifer, J. F. McDonough, Mahoney & Schubert are attorneys.

LA CROSSE, WIS. — A $75,000 theater and office building is to be erected by G. A. Elder, Duluth, Minn., and J. J. Nash, Chicago, at 115-117 North Fourth street. Bentley & Hauser, LaCrosse and St. Paul, Minn., have been commissioned to draw plans.

MILWAUKEE, WIS.—The Harsh & Edmonds Shoe Co. has been granted a permit to erect a steel and concrete addition, eight stories, 81 x 150 feet, to cost $50,000. The power facilities will be extended. George R. Harsh is president.

MILWAUKEE.—O. A. Heller, who recently purchased the Merrill building, Grand avenue, between Second and Third streets, intends to build an L-shaped addition, 8 stories, steel and brick, to cost $125,000. Plans are now being completed.

ROME, WIS.—The mill and hydro-electric plant of the Rome Roller Mills Co. and Bark River Electric Light & Power Co. was destroyed by fire May 1 with a loss of $25,000. Plans for reconstruction are under way.

SHEBOYGAN, WIS.—The common council has authorized the Sheboygan Railway, Light & Power Co. to make extensions aggregating about four miles.

WAUSAU, WIS. — The Marathon county board of supervisors has authorized the construction of bridges in 16 townships at a total cost of $25,000. Steel and concrete construction will be employed and bids will be taken during May and June.

KANSAS CITY, MO.—Smith, Rea & Lovitt, 602 Finance building, are taking bids for a business building, two stories, 114 x 220 feet, to cost $150,000, of brick and reinforced concrete.

ST. LOUIS.—Plans are being made by P. J. Broadshaw, architect, 615 International Life building, for a hotel and store building, seven stories, 100 x 135 feet, to cost $150,000, of brick and reinforced concrete.

ST. LOUIS. — The St. Louis Frog & Switch Co. has increased its capital stock from $200,000 to $350,000; a plant for manufacturing manganese steel castings for special track work will be erected.

ST. LOUIS.—The Safety Appliance Co. has been incorporated to own and manage machine shops for the manufacture of safety appliances for elevators, etc.; $40,000; by Charles and Arthur Beck, Joseph W. Graver and Charles F. Junghaus.

CEDAR FALLS, IA. — Work has been started on the addition to the Cedar Falls Foundry Co.'s plant.

SOUTHERN STATES

NEW ORLEANS. — F. S. Shields, the City Hall Annex, will receive bids until June 17 to install under contract No. 62-D a 15-ton hand operated crane.

SAN ANTONIO, TEX.—The San Antonio, San Jose & Medina Interurban Railway Co. has been incorporated to construct and operate a 15-mile line equipped with gasoline motor passenger cars; $100,000; headquarters at San Antonio.

PINE BLUFF, ARK.—The St. Louis Cotton Compress Co. plans to issue $300,000 in bonds in order to make improvements to the various plants.

PINE BLUFF, ARK. — The Pine Bluff Cotton Compress & Warehouse Co. plans to spend $75,000 for improvements which will provide facilities for handling 150,000 bales of cotton next year.

WESTERN STATES

DILLON, MONT.—Silver Bow and Beaverhead counties will take bids until May 29 for a 3-span steel or concrete bridge 225 feet long with concrete substructures.

MALTA, MONT.—Bids will be received at the United States Reclamation Service offices until 2 p. m., June 10 for work and materials including 2,650 cubic yards of reinforced concrete and the placing of 260,000 pounds of steel reinforcement. A. P. Davis, chief engineer.

MALTA, MONT.—The United States Reclamation Service will receive bids until May 27 for 160,000 pounds of steel reinforcement and 1,500 linear feet of metal flume in connection with construction on the Vandalia Point, Vandalia South canal.

WEISER, IDA.—The Adams County Light & Power Co. prepares to erect a power plant to furnish light and power to the towns of Cambridge and Midvale.

BELLINGHAM, WASH.—B. B. Earling, president of the Bellingham & Northern railroad, and vice president of the Chicago, Milwaukee & St. Paul road, announces that the building of a 3-mile extension of local line to the mills on Lake Whatcom will be followed by a 14-mile railroad into Middle Fork valley of the Nooksack.

SEATTLE, WASH.—Major J. B. Cavanaugh, United States engineer, will receive bids here until June 15 for valves and machinery for the locks of Lake Washington canal at the Narrows.

ANDREWS, ORE.—J. B. Balcomb, executive engineer of the Wild Horse Power & Milling Co. has completed preliminary surveys for a hydro-electric power plant to be installed near here.

PORTLAND, ORE.—McNaughton & Raymond, local architects, will draw plans for a $90,000 building for the Pacific Iron Works; O. F. Heintz, proprietor.

SPRINGFIELD, ORE. — The Oregon & California railroad has bought a site here for a machine shop.

LOS ANGELES, CAL. — The Santa Fe railroad this month will raze its shop buildings here and erect a concrete and steel freight shed to cost $150,000.

OAKLAND, CAL. — The Westinghouse Electric & Mfg. Co., Pittsburgh, plans to erect a $1,500,000 plant here. Construction will start soon.

SAN FRANCISCO.—The M. & S. Ratchet Wrench Co. has been incorporated; $50,000; by J. T. McGeogehegan, A. W. Spear, and W. J. Milliken, Humboldt Bank building.

TRADE NOTES

ANTIGO, WIS.—Dr. J. C. Wright, who recently took over the mortgage on the plant of the International Hoist Co., Antigo, Wis., is preparing to effect a reorganization under a receivership. F. A. Hecker, who has been managing the works for several months, will be named receiver. The company manufactures gasoline engines and power hoisting devices and has been doing a large business.

CINCINNATI. — The Van Bibber Roller Co. has moved from the Hulbert Block to a new location at 428 Elm street, where it has taken a lease for five years.

CINCINNATI.—E. W. Edwards, of the Edwards Mfg. Co. has purchased a controlling interest in the Hale Garment Co., of which he has been elected president. The company manufactures garment making and electric pressing machines. The other officers of the company are: Vice president, David Hale Jr., secretary, G. E. Meyer and treasurer, Wm. Schuhardt.

ELKHART, IND.—The Angidile Computing Scale Co. has been purchased by Pittsburgh capitalists and the capital stock increased from $300,000 to $500,000. S. A. Horner is vice president and director.

GRAND RAPIDS, MICH.—The McMullen Machinery Co. has increased its capital stock from $15,000 to $30,000.

HAMMOND, IND. — Gogebic Steel Co. announces a decrease of capital stock from $500,000 to $75,000.

HIGH BRIDGE, N. J.—The Taylor-Wharton Iron & Steel Co. is financing an increase of plant capacity through the issuance of $500,000 of additional common stock. This stock is being offered to its stockholders and to the public at 110 and William Morris Imbrie & Co., New York City, who are handling the issue, report that the applications already have exceeded the amount offered. The stock has been paying 8 per cent dividends. The Taylor-Wharton Iron & Steel Co. only recently has awarded contracts for the construction of a large new plant at Easton, Pa., which will entail a total stock of $1,800,000 to $2,000,000.

MILWAUKEE.—A speedy resumption of operations in the works of the bankrupt Beaver Dam Malleable Iron Co., Beaver Dam, Wis., is expected to follow the incorporation of the Western Malleable Co., capital stock, $400,000, by the interests which bid in the property at receiver's sale several weeks ago.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(First half delivery.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.00
Malleable, Pittsburgh	14.15 to 14.40
Malleable, Chicago	14.25
Malleable, Philadelphia	15.50 to 15.75
Malleable Buffalo	13.50 to 14.00
No. 1X Philadelphia	15.25 to 15.50
No. 2 foundry, Pittsburgh	14.15 to 14.40
No. 2 foundry, Cleveland	14.25
No. 2 foundry, Ironton	13.50
No. 2 foundry, Chicago	14.25
No. 2X foundry, Philadelphia	14.75 to 15.00
No. 2X foundry, New York	14.75 to 15.00
No. 2X foundry, Buffalo	13.50 to 14.00
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, New York	14.50 to 14.75
No. 2 plain, Buffalo	13.75
No. 2 southern, Birmingham	10.50 to 11.00
No. 2 southern, Cincinnati	13.75 to 14.25
No. 2 southern, Chicago	14.85 to 15.85
No. 2 southern, Philadelphia	14.75 to 15.00
No. 2 southern, Cleveland	14.85 to 15.35
No. 2 southern, New York	14.75 to 15.25
No. 2 southern, St. Louis	14.50 to 15.00
Virginia, 2X, Philadelphia	15.30 to 15.55
Virginia, 2X, Jersey City	15.60 to 15.85
Virginia 2X, New Eng., all rail	16.20 to 16.70
Gray forge (eastern Pa.)	13.90 to 14.25
Gray forge, Pittsburgh	13.65 to 13.90
Gray forge, Birmingham	9.50 to 10.00
Silveries, 5 per cent, Cleveland	17.30 to 17.55
Silveries, 5 per cent, Birmingham	12.50
Silveries, 5 per cent, Chicago	16.85
Silveries, 8 per cent furnace	15.75 to 16.00
Standard low phos., Phila.	21.00
Lebanon low phos., furnace	17.00 to 17.50
Low phos., Pittsburgh	21.65 to 21.90
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	16.00 to 17.00
Charcoal, Birmingham	25.00
Middlesbrough, No. 3, Phila., ex ship	15.00 to 15.25

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bes., 51½ per cent	3.00
Mesabi, non-Bessemer, 51½ per cent.	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7 to 8c
Foreign non-Bess., 50 to 65 per cent.	7 to 8c

COKE

(At the ovens.)

Connellsville furnace	$1.75 to 1.85
Connellsville fur. contr.	2.00
Connellsville foundry	2.40 to 2.65
Connellsville fdy., contr.	2.50 to 2.75
Wise county furnace	1.90 to 2.10
Wise county foundry	2.40 to 3.10
Pocahontas furnace	1.90 to 2.40
Pocahontas foundry	2.40 to 2.75
New River, foundry	2.75 to 3.50
New River, furnace	2.20 to 2.35

FERRO-ALLOYS

Ferro-manganese, Baltimore	$38.00 to 39.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Bes. billets, Pbgh. and Yn.	$20.00
Open-hearth bl., Pbgh. and Yn.	20.00
Open-hearth bil., Phila.	22.40 to 23.40
Bes. sheet bars, Pbgh. and Yn.	21.00
Op.-h'th sh. bars, Pbgh. & Yn.	21.00
Forging billets, Phila.	26.40 to 27.40
Forging billets, Pittsburgh	25.00
Wire rods, Pittsburgh	26.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	23.00 to 24.00
Relaying rails, light, Chicago	$21.50 to 22.50
Angle bars, st. sect. Pbgh., base	1.50c
Angle bars, st., sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.40c to 1.45c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.15c to 1.20c
Structural shapes, Chicago	1.30c to 1.35c
Structural shapes, Philadelphia	1.25c to 1.30c
Structural shapes, New York	1.26c to 1.31c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.30c to 1.35c
Tank plates, Pittsburgh	1.15c
Tank plates, Philadelphia	1.25c to 1.30c
Tank plates, New York	1.26c to 1.31c
Bars, soft steel, Pittsburgh	1.15c
Bars, soft steel, Chicago	1.30c to 1.35c
Bars, soft steel, Philadelphia	1.30c to 1.35c
Bars, soft steel, New York	1.31c to 1.36c
Hoops, carloads, Pittsburgh	1.25c to 1.30c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Minneapolis and St. Paul	32 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, plates and shapes	80 cents

Hoops, less carloads, Pittsburgh.	1.35c
Bands, Pittsburgh	1.15c to 1.20c
Shafting, carloads, Pbgh., disc.	65
Shaft'g less carl'ds, Pbgh., disc.	62
Bar iron, Chicago	1.10c to 1.12½c
Bar iron, Philadelphia	1.20c to 1.25c
Bar iron, New York	1.25c to 1.30c
Bar iron, Cleveland	1.20c to 1.25c
Bar iron, Pittsburgh	1.30c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish'g mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.85c to 1.90c
No. 28 black, Chicago	2.03c
No. 28, tin mill, black, Pbgh.	1.85c to 1.90c
No. 28, galvanized, Pbgh.	2.80c to 2.85c
No. 28, galvanized, Chgo.	3.03c
No. 28, cor. galv., Pbgh.	3.00c to 3.10c
No. 28, painted cor., Pbgh.	2.10c to 2.20c
No. 10, blue annealed, Pbgh.	1.35c to 1.40c
No. 10, blue annealed, Phila.	1.55c to 1.60c
Tin plate, 100 lb., coke, base	$3.40

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv.
Steel, ⅜ to 3 inches	80	71½
Iron, ¾ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	72
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.60
Wire nails, retailers, Pittsburgh	1.65
Plain wire, jobbers, Pittsburgh	1.40
Plain wire, retailers, Pittsburgh	1.45
Galvanized wire, jobbers, Pbgh.	1.80
Galvanized wire, retailers, Pbgh.	1.85
Polished staples, Pbgh.	1.60
Galvanized staples, Pbgh.	2.00
Barb wire, painted, jobbers, Pbgh.	1.60
Barb wire, painted, retailers, Pbgh.	1.65
Barb wire, galv., retailers, Pbgh.	2.05
Barb wire, galv., jobbers, Pbgh.	2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled threads, 80 and 10; cut threads, 80 and 5; larger or longer, 75 and 10.

Machine bolts with hot pressed nuts ⅜ x 4 inches, smaller or shorter, rolled, 80 and 15; cut, 80 and 10; larger or longer, 75 and 15.

Gimlet and cone point lag or coach screws, 80 and 20.

Hot pressed square, blank or tapped nuts, $6.80 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, C. & T. square, blank or tapped, $6 off; hexagon, blank or tapped, ⅝ inch and larger, $7.20; ½-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh.	1.60c to 1.65c
Structural rivets, Chgo.	1.73c to 1.78c
Boiler rivets, Pbgh.	1.70c to 1.75c
Boiler rivets, Chgo.	1.83c to 1.88c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut thread, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch., rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

WASHERS

(Discounts, Iron or Steel, to Jobbers, Cleveland.)

⅛-inch	$7.25
3/16-inch	7.00
¼-inch	7.00
5/16-inch	7.00
¾-inch	7.00

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¾-inch and larger	1.25c
5/8-inch	1.30c
½-inch	1.35c
7/16-inch	1.50c
¼-inch	1.75c

IRON AND STEEL PRICES

Corrected up to Tuesday noon

TACKS

(New York.)

	Discount.
American carpet tacks	90 and 20 and 10
American cut tacks	90 and 20 and 10
Railroad tacks	90 and 40
Gimp tacks	90 and 20 and 10
Finishing nails	70

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, iron and steel	55 and 2½

TRIANGLE REINFORCING MESH

(Per 100 square feet f. o. b. mill, car loads.)

No. 4, plain	$1.00
No. 4, galvanized	1.12
No. 7, plain	.49
No. 7, galvanized	.55
No. 23, plain	1.69
No. 23, galvanized	1.88
No. 26, plain	1.17
No. 26, galvanized	1.30
No. 27, plain	.96
No. 27, galvanized	1.07
No. 31, plain	2.49
No. 31, galvanized	2.76
No. 35, plain	1.17c
No. 35, galvanized	1.30
No. 39, plain	3.05
No. 39, galvanized	3.38
No. 43, plain	1.10
No. 43, galvanized	1.23

SPIRAL RIVETED PIPE

(Per 100 linear feet, f. o. b. factory.)

4-inch, plain	$ 19.76
4-inch, galvanized	30.74
6-inch, plain	33.05
6-inch, galvanized	49.73
8-inch, plain	43.17
8-inch, galvanized	65.00
10-inch, plain	66.42
10-inch, galvanized	96.15
12-inch, plain	83.75
12-inch, galvanized	118.30
14-inch, plain	99.14
14-inch, galvanized	138.85
16-inch, plain	117.53
16-inch, galvanized	166.58
20-inch, plain	183.79
20-inch, galvanized	248.39
24-inch, plain	219.92
24-inch, galvanized	293.99
30-inch, plain	324.81
30-inch, galvanized	430.64

CAST IRON PIPE

Three to 24 in., Cleveland	$22.35 to 22.80
Four-inch, water, Chicago	26.50
Six to 12 inches, Chicago	24.50
Larger sizes, Chicago	24.00
Six inch, water, New York	21.00 to 22.00
Four-inch, water, Birmingham	21.50
Six inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.85c
Steel bars, Philadelphia	1.65c to 1.70c
Steel bars, New York	1.80c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, Cincinnati	1.65c to 1.75c
Iron bars, Philadelphia	1.60c to 1.65c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.90c
Shapes and plates, Philadelphia	1.65c to 1.70c
Shapes and plates, New York	1.85c
No. 10 blue ann. sheets, Chgo.	1.95c
No. 10 blue ann. sheets, Cleve.	2.15c
No. 10 blue ann. sheets, Cinci.	1.95c to 2.05c
No. 28 black sheets, Chgo.	2.55c
No. 28 black sheets, Cleveland.	2.60c
No. 28 black sheets, Cincinnati.	2.45c to 2.55c
No. 28 galv. sheets, Chgo.	3.60c
No. 28 galv. sheets, Cleveland.	3.60c
No. 28 galv. sheets, Cincinnati.	3.45c to 3.55c

IRON AND STEEL SCRAP

(Net tons.)

No. 1 railroad wrought, Chgo.	$ 8.75 to 9.00
No. 1 railroad wrought, Cleve.	9.50 to 10.00
No. 1 railroad wrought, St. L.	7.75 to 8.00
No. 1 railroad wrought, Cinci.	8.00 to 8.50
No. 2 railroad wrought, Chgo.	8.50 to 8.75
No. 2 railroad wrought, St. L.	7.50 to 7.75
Arch bars and transoms, Chgo.	12.00 to 12.50
Arch bars and transoms, St. L.	11.00 to 11.50
Knuckles, coup. and spr'gs, Chgo.	9.00 to 9.50
Knuckles, coup., and sp'gs, St. L.	9.00 to 9.25
Shafting, Chicago	11.50 to 12.00
Shafting, St. Louis	13.00 to 13.50
Steel car axles, Chgo	12.50 to 13.00
Steel car axles, St. Louis	11.50 to 11.75
Locomotive tires, Chicago	10.00 to 10.50
Locomotive tires, St. Louis	9.00 to 9.50
Cut forge, Chicago	8.50 to 8.75
Pipes and flues, Chicago	6.75 to 7.25
Pipes and flues, Cleveland	8.00 to 8.50
Pipes and flues, St. Louis	6.50 to 7.00
No. 1 cast, Chicago	9.75 to 10.25
No. 1 cast, Cleveland	10.75 to 11.00

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley furnaces	1.20
Cincinnati	2.00

No. 1 cast, Cincinnati	9.25 to 9.75
No. 1 cast, St. Louis	10.00 to 10.50
No. 1 busheling, Chicago	7.25 to 7.75
No. 1 busheling, Cleveland	8.50 to 9.00
No. 1 busheling, Cincinnati	6.00 to 6.50
No. 1 busheling, St. Louis	7.50 to 8.00
No. 2 busheling, Chicago	6.00 to 6.25
No. 1 boiler plate, cut, Chgo.	6.50 to 7.00
No. 1 boiler plate, cut, Buffalo	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	6.00 to 6.50
Boiler punchings, Chicago	9.75 to 10.25
Cast borings, Chicago	4.50 to 5.00
Cast borings, Cleveland	6.00 to 6.50
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.00 to 4.50
Machine shop turnings, Chgo.	5.25 to 5.50
Machine shop turnings, Cleve.	5.50 to 6.00
Machine shop turnings, Cinci.	4.50 to 5.00
Machine shop turnings, St. L.	4.50 to 5.00
Malleable, agricultural, Chgo.	8.50 to 9.00
Malleable, agricultural, St. Louis	7.25 to 7.50
Malleable, railroad, Chicago	9.50 to 10.00
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	8.00 to 8.25
Angle bars, iron, Chgo.	11.75 to 12.25
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo.	8.25 to 8.75
Angle bars, steel, St. Louis	9.00 to 9.50
Stove plate, Chicago	9.25 to 9.75
Stove plate, Cleveland	8.25 to 8.75
Stove plate, Buffalo	9.75 to 10.00
Stove plate, Cincinnati	7.00 to 7.50
Stove plate, St. Louis	7.50 to 8.00
Bundled sheet, Cincinnati	4.75 to 5.25
Wrought iron pil'g plates, Clev.	13.00

(Gross Tons.)

Heavy melting steel, Pbgh	$12.00
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	10.00 to 10.50
Heavy melting steel, Cleveland	10.00 to 10.75
Heavy melting steel, Cincinnati	9.00 to 9.50
H'vy melting steel, eastern Pa.	10.75 to 11.00
Heavy melting steel, New York	8.50 to 8.75
Heavy melting steel, St. Louis	11.00 to 11.50
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.50 to 10.00
Grate bars, New York	6.00 to 6.50
No. 1 railroad wr'ght, east. Pa.	12.50 to 13.00
No. 1 railroad wrought, Pbgh.	11.00 to 11.50
No. 1 R. R. wght., New York	11.00 to 11.50
No. 1 R. R. wrought, Buffalo	11.00 to 11.50
Shafting, New York	12.25 to 12.50
Pipes and flues, New York	8.00 to 8.25
Pipes and flues, eastern Pa.	10.00 to 10.50
Mch. shop turnings, New York	5.50 to 5.75
Machine shop turnings, Buffalo	5.50 to 6.00
Mch. shop turnings, Pbgh.	7.75 to 8.00
Mch. shop turnings, eastern Pa.	7.50 to 8.00
Cast borings, New York	5.50 to 5.75
Cast borings, eastern Pa.	8.00 to 8.50
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	7.75 to 8.00
Stove plate, New York	7.50 to 7.75
Stove plate, Pittsburgh	9.50 to 9.75
Stove plate, eastern Pa.	8.50 to 9.00
Shoveling steel, Chicago	9.75 to 10.00
Shoveling steel, St. Louis	9.00 to 9.50
Reroll'g rails, 5 ft. & ov., Pbgh.	13.00 to 13.25
Reroll. rails, 5 ft. and ov., Chgo.	11.75 to 12.25
Reroll. rails, 5 ft. and ov., Cleve.	11.75 to 12.25
Rerolling rails, 5 ft. and over, eastern Pa.	12.25 to 12.75
Reroll. rails, 5 ft. and ov., St. L.	12.00 to 12.50
Steel rails, short, Chicago	10.75 to 11.25
Steel rails, short, Cleveland	13.00 to 13.50
Steel rails, short, eastern Pa.	11.00 to 11.25
Steel rails, short, St. Louis	11.50 to 12.00
Iron rails, Cleveland	13.50 to 14.00
Iron rails, Cincinnati	10.50 to 11.00
Iron rails, eastern Pa.	15.00 to 16.00
Iron rails, St. Louis	12.00 to 12.25
Frogs, switches, guards, Chgo.	9.75 to 10.25
Frogs, switches and g'rds, St. L.	10.25 to 10.50
Car wheels, (iron), Pittsburgh	12.00 to 12.50
Car wheels (steel) Pittsburgh	13.00 to 13.50
Car wheels, Chicago	11.50 to 12.00
Car wheels, eastern Pa.	11.75 to 12.00
Car wheels, Buffalo	12.00 to 12.50
Car wheels, N. J. points	11.50 to 12.00
Car wheels, St. Louis	11.00 to 11.25
Iron axles, Pittsburgh	22.50 to 23.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	20.00 to 21.00
Iron axles, Buffalo	21.50 to 22.00
Iron axles, Chicago	19.00 to 19.50
Steel car axles, New York	13.00 to 13.25
Steel car axles, Buffalo	15.00 to 15.50
Steel car axles, Cleveland	16.50 to 17.00
Steel car axles, eastern Pa.	14.00 to 14.50
No. 1 busheling, Buffalo	8.50 to 9.00
No. 1 busheling, Pittsburgh	10.00 to 10.25
No. 2 busheling, Buffalo	6.00 to 6.50
Low phosphorus steel, Buffalo	15.00 to 15.50
Low phosphorus steel, Pbgh.	14.00 to 14.25
Low phos. steel, eastern Pa.	14.50 to 15.00
No. 1 forge, eastern Pa.	8.50 to 9.00
No. 1 cast eastern Pa.	13.00 to 13.50
No. 1 cast, Pittsburgh	12.00 to 12.25
No. 1 heavy cast (N. J. points)	12.00 to 12.50
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Mall. iron, agricul., Cleveland	9.00 to 9.50
Mall. iron R. R., Cleveland	10.50 to 11.00
Malleable, railroad, Pittsburgh	10.00 to 10.25
Malleable R. R. Buffalo	10.75 to 11.25
Mal., R. R. east. Pa.	9.00 to 9.50
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Bundled sheet, Cleveland	6.50 to 7.00

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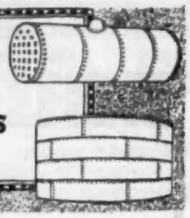

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Cleveland, Ohio

Electric Drive for Existing Mills

(*Continued from page 886.*)

saving in efficiency by putting in the continuous-current motor does not outweigh the greater cheapness of the three-phase motor. This saving in efficiency is due to a number of causes, which it is perhaps of interest to enter into.

Take the case of a large sheet mill which requires a motor of, say, 1,000 or 1,500 horsepower, and a speed on the mill of 30 to 32 revolutions per minute. With a mill of this sort a heavy flywheel of 100 to 150 tons would be necessary, running at the mill speed, in order to equalize the very heavy peak loads attendant on this class of work, and a fall in speed of at least 10 per cent from no-load to full load would be necessary, so that proper use can be made of the stored energy.

Take, now the case of a three-phase motor, it is almost impossible to build such a machine running at a speed of 32 revolutions per minute, on account of the very large number of poles which would necessarily be entailed, and even if such a machine were built, the power factor would be so bad that very few power companies would permit it to be connected to their mains. It would thus be necessary to put in a higher speed motor with some form of reduction transmission between the motor and the mill.

In the case of a continuous-current motor, there is no difficulty attached to the building of a machine to run at this speed, so that in this case there is—firstly, a saving in the transmission losses, and secondly, a saving in slip resistance losses. These latter losses occur in the case of the three-phase motor due to the fact that the only method of reducing the speed of a plain induction motor is by inserting resistances in the rotor circuit, and the loss in these resistances is proportional to the fall in speed. To reduce the speed 10 per cent on full-load as is necessary to utilize beneficially the flywheel energy a loss of 10 per cent would occur in the resistances. On some tests which were taken on a sheet mill it was found that the average loss due to the slip resistance losses represented between 13 and 15 per cent of the total energy consumed, and when to this loss is added the transmission loss, which may equal another 5 or 10 per cent the advisability of installing a direct-coupled continuous-current motor to such a mill must be very carefully weighed.

Modern practice to a great extent has gone in favor of the direct coupled drive, even for speeds as low as those required for a heavy sheet mill, namely 32 revolutions per minute. Of course, in the case of merchant mills where the speeds may vary from 100 revolutions per minute upwards, the direct-coupled drive presents no difficulties, and the question of the difference in capital cost between a direct-coupled drive and a gear or rope drive has not to be so seriously considered as is the case in a very slow speed drive. In a great many cases, however, the extra additional cost of the slow speed drive is more than counterbalanced by the gain in efficiency due to the absence of any form of transmission losses between the motor and the mill. These losses are a heavy item in the yearly expenditure, as can be seen when the losses in the various forms of transmission are considered. Taking the case of gearing, it can be assumed with a fair degree of accuracy that the losses taking place in a single reduction represent about 5 per cent *of the power which is being transmitted*. This value is perhaps excessive when taken on a gearing which has just been newly put down, but for varied conditions of working, and when the gears have become somewhat worn, it is not safe to assume that any less loss than this takes place. In the case of a rope drive the percentage loss taking place in the drive alone is a somewhat moot point, some authorities giving the losses up to as much as 10 per cent, while others place the figure as low as 2 per cent. As, however, one of the first author-

ities on rope drives suggests that a figure of 5 per cent is a good working figure, it is probably quite safe to accept this figure as being the correct amount to take into account. Special emphasis in the case of a rope drive must be laid upon the fact that the loss occurring in the ropes remains practically constant whether the ropes are running light or transmitting power.

One of the questions which arises when the conversion of an existing mill is contemplated is the length of time for which the mill will have to be shut down in order to make the change-over, and it is imperative, in most cases, that this time should be reduced to a minimum. This consideration is one which, in a number of cases, lends itself to the introduction of a rope drive, as the foundations of the motor and the motor itself can be put down without interfering with the working of the mill, and the mounting of the rope pulley for coupling to the mill is very often a matter of quite a short time, and sometimes not much more than a long week-end.

It is sometimes possible to put down the motor on the side remote from the steam engine, and this was done on the second electrically-driven reversing mill which was installed in England. This plant has been working now for 5½ years, and no trouble whatever has been experienced through its having been found necessary to transmit the drive through the bottom spindle to the pinions.

The cost of having a large, slow-speed flywheel is usually somewhat in excess of having a high-speed flywheel, but the difference is not, in many cases, very great on account of the fact that the full peak loads of the mill in the latter case have to be transmitted from the motor and flywheel through the gearing or ropes as the case may be. The size of the gearing, and the number of ropes, will have to be very materially increased to withstand this extra strain. As the ropes and gearing are usually admitted to be evils, the reduction of them to their smallest dimensions is advisable, and this can be done by designing them to transmit only the normal power of the motor and allowing excessive mill peaks to be taken up by the directly coupled flywheel.

Forthcoming Meetings

American Foundrymen's Association.—A. O. Backert, secretary, Penton building, Cleveland. Convention Sept. 7-10, La Salle hotel, Chicago.

American Hardware Manufacturers' Association.—F. D. Mitchell, secretary, 1510 Woolworth building, New York. Next meeting to be held jointly with Southern Hardware Jobbers' Association at White Sulphur Springs, West Va., June 9-11.

American Institute of Electrical Engineers.—F. L. Hutchinson, secretary, 33 West Thirty-ninth street, New York. Next meeting at Detroit, June 23-26.

American Institute of Mining Engineers.—Bradley Stoughton, secretary; Albert Sauveur, chairman of Iron and Steel Committee, 29 West Thirty-ninth street, New York. Next meeting in Salt Lake City, Aug. 10-14.

American Iron and Steel Institute.—James T. McCleary, secretary, 30 Church street, New York. Next meeting, May 22 and 23, 1914, at New York.

American Society for Testing Materials.—Prof. E. Marburg, secretary, University of Pennsylvania, Philadelphia. Next meeting, June 30 to July 4, at Hotel Traymore, Atlantic City, N. J.

American Society of Civil Engineers.—C. W. Hunt, secretary, 220 West Fifty-seventh street, New York. Regular meetings at New York, first and third Wednesday of each month, except June and August.

American Society of Mechanical Engineers.—Calvin W. Rice, secretary, 29 West Thirty-ninth street, New York. Next meeting, June 16-19, at University of Minnesota, Minneapolis.

American Railway Engineering Association.—E. A. Fritch, secretary, 900 South Michigan avenue, Chicago. Next meeting in March, 1915, at Chicago.

Association of Iron and Steel Electrical Engineers.—W. T. Snyder, secretary, National Tube Co., McKeesport, Pa. Next convention, Sept. 14-19, Cleveland, O.

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